

JUNE, 1958



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AT5	Transmitters, as new, with valves & dust covers	£2/17/6
AT5/AR8	Aerial Coupling Units, as new	£2
1155	Com. Receivers, fair condition, with valves	£12/10/6
Local	Valve Sockets	1/- each
BC611 (SCR536)	Walkie-Talkie, American, complete with valves	£25 a pair
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Single	Gang Condensers, 0.004 capacity, Ceramic	10/-
Two-gang	Split-Stator Condenser, 8 to 25 pF. per sect.	30/-
Four-gang	Condensers, approx. 150 pF. per section	£1
Midget	Ceramic Trimmers, 3 to 55 pF.	1/-
24 volt	to 230 volt A.C. Inverters, approx. 50 watts	£10
Teletron	Octal Valve Sockets	1/- each
Meters—	0-0.25 amp. R.F. FS6 and 101 type	10/-
Meters—	0-500 microamp., 1 1/2" diam., flush mounting	30/-
Meters—	0-1 Ma. D.C., 2" round, Weston, Brand new	45/-
Meters—	0-30 Ma., 2 1/2" round type, American	40/-
Meters—	0-100 Ma. 2" square, sealed 6-300, new	£1
Meters—	0-40 amp. A.C. 2 1/2" round type	25/-
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SCR522 Receivers, less valves £5

SCR522 Transmitters, less valves £5

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Two-way Toggle Switches, D.P.D.T. 5/- each

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# AMATEUR RADIO

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**EDITORIAL**

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# The Triband Beam at VK2AOU

BY H. F. RUCKERT,\* VK2AOU

THE first part of this paper (May "A.R.") described measurements, with the help of the grid dip oscillator (g.d.o.), to investigate the properties of triband beam components and two-band and triband circuits. We saw two-band and triband tuned circuits which were tunable over a wide range of frequencies, and these resonances had not to be harmonically related. As far as the lower frequency resonances are concerned, it had been of no consequence if the tuning components were lumped capacitors and inductors or pieces of twin lead or co-axial cable or electrically identical arrangements. It was more than once demonstrated that it is wrong to talk about a "switching stub principle." Various methods were described how to get the desired third resonance for example within a frequency range of 1:2, as this is required to be able to achieve 14 Mc., 21 Mc. and 28 Mc. operation.

Tests carried out by close friends of the writer showed also the expected results and that the performance is identical if we use two parallel tuned circuits in series or one series and one parallel tuned circuit in parallel between the beam elements. The first mentioned version has been in operation at VK2AOU for over a year with very good DX results, whilst the second version represents the writer's interpretation of the function of the G4ZU beam, especially as far as the triband reflector is concerned. It may be said again that both circuit versions may be used in connection with single or multi-element vertical or horizontal aerials and any number of elements may be equipped with this L.C. tuning.

The writer converted his three element 20 metre vest-pocket beam without altering the length of the elements or the element spacing. If longer elements are on hand and can be accommodated, it can only be recommended to use those. It also does not matter if all elements have the same length because the L.C. components take care of the tuning correction required. The longer the elements, the better is the beam performance, especially on the lowest operating frequency, close for 20 metres and not too wide spaced for 10 metres. If one has a longer boom it can be recommended to increase the spacing between the rad-

The spacing should be chosen in such a way that the elements are not too later and the director. The reflector-to-radiator spacing should not be made smaller than five feet. The later given coil and capacitor table is only a guide, the values will have to be changed if other element length and different spacing are used. Making the elements shorter than those of a full size 15 metre beam will greatly reduce the 20 metre performance.

The described beam has the efficiency of a three element shortened beam on 14 Mc., of the full size three

element beam on 21 Mc., and of a 5 to 6 element beam on 28 Mc. The radiation pattern is symmetrical. The forward gain and front-to-back ratio are equal to those found on other beams of similar dimensions and having the same number of elements. Another feature, common to all Yagi type beams, is that we can choose to tune the elements for best forward gain, front-to-back ratio, or we may select a compromise.

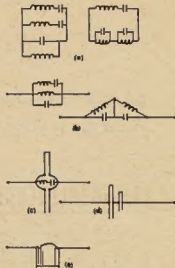


Fig. 1—Triband Tuned Circuits and Triband Dipoles.

- Two versions of Triband Tuned Circuits.
- The Dipole element replaces one circuit.
- Closed and Open Stub replacing one parallel tuned circuit.
- Stubs replacing all lumped L and C components.
- Open Stub inside tubing of Closed Stub, so that the distributed L of the Stub, together with the distributed C of the Stub, replaces one series tuned circuit. The Stubs replace the parallel tuned circuit.

## THE ALIGNMENT

A simple, quick and sometimes satisfactory alignment can be achieved by resonating the elements to predetermined frequencies with the aid of a calibrated g.d.o. But we are never free of the strange feeling that we may give a high percentage of the possible performance away unless tests have convinced us that no better gain and/or front-to-back ratio can be achieved, no matter which adjustment gets changed. It does not matter which aerial we are talking about, the performance achieved during the alignment procedure can only be retained if the alignment is carried out with the aerial in the final operation position, e.g. on top of the mast or tower.

Any increase of the aerial's height above ground or other conductors (tin roofs, etc.) must reduce its capacity

and the resonances will therefore shift to higher frequencies.

At the same time the low standing wave ratio (s.w.r.), adjusted near the ground, will now be found at a higher frequency which may well be outside the range we intend to operate. This undesired detuning affects mainly the lowest operating frequency, especially if the elements are relatively short. The extended elements like those used on 28 Mc. are practically not affected in this regard.

It was found that the detuning amounts to 200 to 400 Kc., depending on the local conditions like earth conductivity, etc., for a 20 metre beam, if the array was first six feet and then 40 or more feet above ground. It may therefore be advisable to take this into account when the adjustment frequencies are selected.

The writer was also in a typical and not ideal position having the beam between the garage on one side and the grape vine along the fence on the other side of the backyard. Knowing that the elements can easily be tuned over a wide range of frequencies, it is therefore also very likely that by accident the reflector and director, or one of them, may change the function, which would very much upset the gain and front-to-back ratio. The only reliable method of alignment is therefore only then given when we have field-strength indicators behind and in front of the beam.

A six feet long folded dipole with a Ge diode and a 1 Ma. meter was placed about 7 feet behind the reflector to read instantly the relative backward radiation. A full length half wave dipole for 10 metres, and with extension wires for 15 and 20 metres, was installed about 80 feet in front of the beam. The radiation was received through the brick house. A length of two-core cable (any type will do) was run on the ground between the dipoles and the 50  $\mu$ Amp. meter back to the beam where it was placed in a position so that both meters could be read whilst adjustments on coils or capacitors were made.

Like any other Yagi beam, we can also use here reflector resonances which are about 1/5 lower, and director resonances which are about 5% higher in frequency than what the mainly-used transmitter frequencies on the three bands are.

As mentioned earlier, we may now take into account the detuning effect, caused by later putting the beam in a higher position, by subtraction of several 100 Kc. from the 14 Mc. resonances. We should at least see that metallic conductors are not too close and especially not running parallel to the beam elements to reduce the detuning.

If one uses different element lengths than those described it may be advisable to use No. 13 wire for the coils for the tests because these coils are easily adjusted and bent. They should be later replaced by coils made of 1/8"

\* 23 Berrille Road, Beverly Hills, N.S.W.



diameter copper wire, which is self-supporting.

We can now align each element to its three resonances with the help of a calibrated g.d.o. The coil of the g.d.o. may be held near the large aerial tuning coil if the lowest and the medium resonance frequency is checked, whilst the g.d.o. should be held near the smaller coil to measure again the medium and also the higher resonance frequency. The work now to be done is similar to the alignment of a superhet receiver to achieve correct tracking at three predetermined frequencies.

By changing the L/C ratio of one tuned circuit we can retain the lower of the two resonances but shift the higher resonance frequency. More capacitance brings the two resonances concerned closer together.

The length of the elements affects all frequencies, but mainly the lowest resonance.

The larger coil tunes mainly the lowest frequency.

The larger capacitor (parallel to the larger coil) affects mainly the medium resonance.

The smaller coil tunes mainly the medium resonance.

The smaller capacitor (parallel to the smaller coil) tunes mainly the highest resonance.

There is a slight pulling effect when adjusting one or the other capacitor or inductor, but one will soon find out that detuning of other resonances can easily be compensated. It is a straightforward job if we start with the lowest frequency. Then we see that the medium frequency becomes right without shifting the lowest frequency.

So far only the larger L and C were used. Now with the smaller L and C again the medium resonance frequency is tuned in and we have to see that the highest resonance frequency is right without detuning the medium frequency too far. Finally, we re-check the lowest frequency and perform small adjustments when necessary. This procedure is carried out with one element after the other. Only systematic work as described has a chance of success and will quickly bring the expected results.

We now connect the feeder, if this was not already done, and switch the transmitter on—using reduced power, just enough to be able to read the field strength indicators. A bandswitching transmitter or a test oscillator with a few watts of power should be used to be able to change quickly the operating bands. If we use a tuned feeder and therefore not L-C tuning for the radiating element, 300 ohm twin lead cable is quite satisfactory as feeder for the tests, or even later when the r.f. power is less than 50 watts. In this case the transmitter and the aerial coupler are retuned to the operating frequency so that correct loading occurs. If we use a flat line feeder, and therefore L-C tuning for the radiating element, the transmitter loading depends largely on the tuning of the L-C components of the radiator element. Therefore the radiator is first corrected before other elements are adjusted.

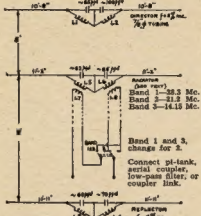
The g.d.o. tuning may be mainly understood as a useful prealignment, which may be satisfactory, but only the tests with the field-strength indicators will guarantee top performance. This

applies actually to any beam or aerial. The transmitter power may be so adjusted that the field-strength indicator, which is reading the forward gain, shows about full scale deflection; or a variable resistor may be placed across the meter. The shafts of the variable air dielectric capacitors should have insulating knobs.

The first-found g.d.o. adjustment settings should be marked to be able to find these tuning positions easily again. It is extremely interesting to watch the meters of the field-strength

Fig. 2—L-C Tuned Triband Beam at VK2AOU.

The element length was so chosen that the beam has full size at 21 Mc. Shorter or longer elements may be used if so desired.

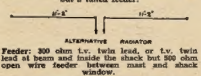


Any length of any co-axial or twin lead cable may be used for the two feeders. With L7 and L8 correct matching with low s.w.r. can be achieved.

L1-4 turns, 1.77 inch long, 1.58 inch diam.	
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L1-81 " " 2.5 " " 1.58 " "	
L1-82 " " 1.8 " " 1.58 " "	
L1-83 " " 2.5 " " 1.58 " "	
L1-84 " " 1.8 " " 1.58 " "	
L1-85 " " 2.5 " " 1.58 " "	
L1-86 " " 1.8 " " 1.58 " "	
L1-87 " " 2.5 " " 1.58 " "	
L1-88 " " 1.8 " " 1.58 " "	
L1-89 " " 2.5 " " 1.58 " "	
L1-90 " " 1.8 " " 1.58 " "	
L1-91 " " 2.5 " " 1.58 " "	
L1-92 " " 1.8 " " 1.58 " "	
L1-93 " " 2.5 " " 1.58 " "	
L1-94 " " 1.8 " " 1.58 " "	
L1-95 " " 2.5 " " 1.58 " "	
L1-96 " " 1.8 " " 1.58 " "	
L1-97 " " 2.5 " " 1.58 " "	
L1-98 " " 1.8 " " 1.58 " "	
L1-99 " " 2.5 " " 1.58 " "	
L1-100 " " 1.8 " " 1.58 " "	

The leads to the capacitors were 4 inches long. The leads to the coils were 2 inches long. The coils have to be mounted at right angles (decoupled). 40 pF. fixed and 50-100 pF. air variable capacitors were used.

Radiator Element if L-C Tuning is not used but a tuned feeder:



Feeder: 300 ohm t.v. twin lead, or t.v. twin lead at beam end inside the shack but 300 ohm open wire feeder between mast and shack window.

indicators whilst the capacitors are slightly adjusted and coils are expanded or pressed together to change their inductance. It is also very instructive to replace the beam with a dipole to compare the relative field-strength values. This test will also show that the beam is working properly.

At first we have to tune for top performance on 20 metres after making up our mind as far as front-to-back ratio

or forward gain should be mainly achieved. We mark the capacitor setting. Now we try the same for 15 metres by adjusting the capacitors slightly until the best results occur also on this band. Now we will see how far we have to change the large coil and the capacitor to get the best performance on both bands with the same setting of the L and C.

If the beam fires occasionally backwards, don't get a shock, remember that now most likely the director is tuned too low and acts as a reflector whilst the opposite may be true for the reflector. A 10 pF. change of the tuning capacitors may remedy the wrong adjustment. The same procedure has to be carried out with the smaller L-C components responsible for the tuning on 15 and 10 metres. The 10 metre tuning is far less critical and a "near enough" adjustment will give fully satisfactory results, whilst the 20 metre front-to-back ratio has to be very accurately tuned in.

During this operation it is advisable to re-check occasionally the 20 metre tuning and to reset the larger capacitor if required. This procedure may begin with the reflector and afterwards with the director. It may be good to remove at first the director element to prevent interference by wrongly tuned elements. When checking front-to-back ratio it may be remembered that several lobes of radiation are leaving the beam under different angles of elevation. Therefore a local receiver will give different results than a DX station's report, which does not receive the ground wave and low angle radiation.

## FEEDING METHODS

The circuit of the beam includes, besides all the dimensions of the elements, coils and capacitors, also details of a feeding method for flat line feeders which the writer had tried out and developed. In this case the radiating element is also L-C tuned like the other elements. The feeders are link coupled to the tuned circuits as this is well known from link lines between tanks and aerial couplers, especially with a low-pass filter in this line we must have a low standing wave ratio (s.w.r.). It is the usual practice to tune out the inductive reactance of the coupling coils, more or less, by connecting a variable capacitor in series with the link coil at the transmitter end. By adjusting the L/C ratio of link coil and series capacitor, the s.w.r. can be affected. We know also the very effective link coupling of flat line feeders to the loading coil of vest-pocket beams.

As we have seen already with the g.d.o. the larger coil is effective at the lowest and medium frequency, whilst the energy has to be coupled to the smaller coil for the operation on the highest frequency; this coil can also be used for the medium frequency. The most effective coupling is achieved when the two required feeder cables, or actually the coupling coils are connected in series. If we don't like a switch at the aerial end of the feeder, we can use two feeders and perform the switching at the transmitter end.

The phase of the currents in the tuned circuits has to be taken into consideration. At the lowest and the highest frequencies, the currents are of

identical phase, but this is not so at the medium frequency. We therefore need the changeover switch, for example, at the transmitter end of the feeder cables.

If a suitable number of turns for the coupling coils is selected, it is possible to match any type of aerial feeder cable from 50 to 300 ohm impedance. The feeder may be coupled or connected to the transmitter final, to a pi-filter, any sort of aerial coupler, or low-pass filter.

The experts agree that the feeder with the lowest losses is still the now less-popular open-wire feeder. The greatest difficulties experienced with open-wire feeders are the danger of the feeders shorting out when the beam gets rotated, and the installation of the feeder in the house. Both problems can easily be overcome by using partly 300 ohm twin lead (4 to 6 feet) between the radiating element and a fastening point underneath the beam on the mast or tower. This piece of cable is wound with two turns like a spiral around the pipe carrying the beam. From this point down to the window of the shack we can use open-wire feeder. No. 13 copper wire with two-inch spacing is very satisfactory. A small grip of perspex every two feet apart can act as spreader. Sliding down of these spreaders may be prevented by soldering a blob of solder to the feeder underneath the spreaders. From the shack window to the transmitter again 300 ohm t.v. twin lead can be used. Even r.f. power of up to 200 watts will not cause the twin lead to get warm, which would indicate high losses. In several cases quite good results were obtained with 300 ohm twin lead instead of the open-wire feeder. Transmitter twin lead cable would be suitable for all power levels.

Other feeding methods have been described lately in connection with other multiband beams which may also be used with this beam.

## CONSTRUCTION

Just a few not-so-common points may be mentioned concerning the practical construction of such a beam. The writer used an Oregon timber 1" x 2" 14 feet long boom. A duralumin boom would have reduced the weight of the beam. Four feet long crossarms carry the beam elements. Each cross-arm is mounted to the boom with brackets. Each half element is held by aluminium sleeves and is screwed to two ceramic stand-off insulators. The total weight of the light duralumin tubing is only four pounds. The inner ends of the elements are about four inches apart. Just as far away is a third stand-off insulator which is screwed to the boom, so the pairs of coils can be mounted at right angles to prevent coupling.

The coils are made of copper wire of 1/8" diameter, and they are self-supporting. The capacitors are a combination of 40 pF. fixed ceramic double cup capacitors and short wave receiver type 50-100 pF. air dielectric variable capacitors. The capacitors may be placed in plastic containers which are to be mounted upside down to protect the capacitors from rain. Even fairly strong elements may swing and vibrate in the wind and get bent or broken during a storm, or material fatigue will sooner or later cause break-

age. The writer's beam was once converted in this way to a "three element vee beam," before special precautions were taken.

Now the boom was extended by four feet at each end beyond the point where the tubing of the elements is fastened to the boom. Nylon fishing line triangles are now holding the elements in the forward and backward direction as well as the boom in the correct position. No trouble has been experienced over the last year in spite of several heavy storms.

The total weight of the beam and wooden boom amounts to 21 lbs. This beam is rotated by a small t.v. receiver aerial rotor, which has been doing this job for the past four years. The writer's beam is 44 feet above ground. A four feet long crossarm is mounted underneath the beam on the pole and can be swung in such a position that a fork-like piece of steel holds the boom in a fixed rest position to take the force of the swinging beam off the motor gears when the beam is not used or rotated. This cross arm is controlled with two galvanised wires from the ground.

## RESULTS

During the 1957 VK/ZL Contest 150 DX phone contacts were made during 17 hours of operation on 10, 15 and 20 metres. About ten times the DX partners mentioned that it was the strongest signal from VK he could copy. Similar reports were received many times when chasing DX with tough competition. We may interpret these reports in the following way: This beam is neither a "wonder beam" nor a medium efficient "compromise." This beam is on 20 metres equal to a full size two element beam, and on 15 metres equal to a full size three element beam, taking correct tuning and identical operating conditions for granted. The beam

was often reported to be better than cubical quad aerials. On 10 metres the performance is apparently superior to the usual 3 or 4 element arrays.

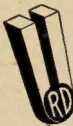
It is a light and small construction which makes DX work on three bands a pleasure. This beam has more effective element length than the G4ZU beam. The version with coils, as shown, has no resonances on harmonics, which should help to suppress the radiation of t.v.i. coupling harmonics, and this is in contrast to other aerials and Yag beams which resonate at odd harmonics. If stubs are used one will find other resonances at higher frequencies.

It is often said that the tuning coils are causing excessive losses, but no explanation is given. We know that, for example, of 100 watts r.f., 75 watts would have to be converted into heat in the coils, before the QSO partner would report a signal reduction of one S point. But 75 watts would certainly heat up the coil which is, of course, not the case in practice. We know that it is quite simple to select the correct L/C ratio for an aerial coupler and its coil will remain at room temperature, because these coils have very low losses, and at some frequencies not much current is flowing through the coils.

Unsatisfactory results with inductive loaded aerials are most likely due to wrong tuning of the elements and/or mismatch of the feeder.

Thousands of inductive loaded beams are working all over the world to the fullest satisfaction of their owners. We must also not forget that the number of Amateurs who can put up a small triband beam is many times larger than the number of those who can erect three full size beams.

It is advisable to check the patent position before producing L-C tuned beams commercially.



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# AMATEUR TELEVISION

## PART FOUR

BY E. E. CORNELIUS,\* VK6EC/T

UP to date I have discussed the essentials of a system capable of generating good pictures, ready for transmission. In later parts I will describe additional units which will enable more ambitious presentation, and better supervision of the outgoing picture.

### POWER SUPPLIES

At this point it is desirable to go into the techniques of power supplies for television. Orthodox power packs, with LC filtering are useless for television, regulated power supplies being essential. Due to need for clamping and d.c. restoration, throughout the transmission chain, the system has a response effectively down to d.c. To delineate large areas of light and shade, the low frequency response must be far better than in audio practice, and a square wave tilt of less than 2% at 50 cycles is desirable. A tilt greater than 5% is objectionable, causing shading and streaking. The power supplies will therefore have to have a very low source impedance of the order of 1 ohm or less, from d.c. to the limit of the video range.

Similarly, power supply ripple of 2% at 50 or 100 cycles shows as objectionable hum bars in the picture, and become more objectionable with time. Unlike the ear, the eye does not become tolerant to the effects of hum, and power supply ripple must be of the order of millivolts.

These two features of low source impedance and negligible ripple are easily obtained from regulated power supplies, but at the expense of additional tubes, and heat dissipation. But the regulator acts as an excellent filter, and LC filtering can be quite nominal. Glow tube stabilisation is useless, as the internal impedance of the OD3, etc., are of the order of 200 to 500 ohms.

Power requirements are considerable, and the camera and c.c.u. described, on a common power supply, have a main requirement of 260 volts at about 600 mA. The use of different tube types could reduce this somewhat, but on the basis of two picture tube line time bases at 120 mA. each, three magnetic focus coils at 40 mA., and 20 video amplifiers at 10 mA. each, it will be seen that the total must be considerable.

The cost of the regulator section is not great, as almost any disposals power tubes can be connected in parallel. The main cost is in the power transformers and filter choke, and rather more electrolytics than usual. Per power pack that is, not per millampere, the regulated power pack is more economical on this basis. If you have the facilities for winding your own transformers and chokes, the cost of these units can be cut by a factor of five at least. Winding details are given later.

There are two basic regulator types, series and shunt. For the more onerous duties, the series regulator seems the better and has been used in the camera/

c.c.u. pack. The shunt regulator is simpler and cheaper, and is used in the video mixer. While I use series regulators in the Master Monitor and c.c.u., these were built some time ago before I was introduced to shunt regulation. Shunt regulated power supplies should be quite satisfactory for these units, but I favour series for the transmitter proper. The various disadvantages and advantages of each may be summarised as below.

### Series Regulation

1. Zero source impedance readily obtained.
2. Negligible ripple easily obtained.
3. Will maintain regulation from full to no load.
4. Has simple control of output voltage over a wide range. (This has little value in television applications.)
5. No negative supply is needed for the regulator. This also is little advantage in t.v., as a negative supply is certain to be needed for other reasons.
6. Minimum filtering needed before the regulator.

### Disadvantages—

1. Requires sufficient regulator tube capacity for the full load current.
2. Has an inherent regulator tube voltage drop of over 100 volts, all dissipated in heat, with resultant higher transformer ratings and electrolytic capacitor voltage ratings.
3. Regulator tube filaments must have a separate winding.

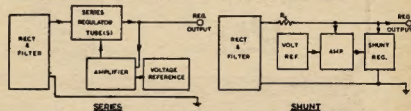


FIG. 18—REGULATED POWER SUPPLIES

### Shunt Regulator

#### Advantages—

1. Regulator tube capacity required is only enough to cope with load current changes.
2. No inherent voltage drop, and hence much lower power transformer ratings.
3. Regulator tube filaments may be at earth potential.

#### Disadvantages—

1. Not easy to obtain low source resistance.
2. Not so easy to reduce ripple, unless normal filtering is good.
3. Cannot be run off load, unless regulator tube capacity is the same as for series regulation.
4. Needs a negative supply.

5. Output voltage can be varied over only very narrow limits.

6. Reasonably close tolerance components are needed in the amplifier section.


Referring now to Fig. 16, the basic principle is as follows: The regulated output voltage is compared with a stable reference voltage, a glow tube, and the variations of output voltage are fed to an amplifier the output of which is applied to the regulator tubes, to offset the original change. In the series regulator, the series tube or tubes have their internal impedance varied such that the output voltage is held constant. In the shunt regulator, the shunt tube draws more or less current, causing a change in voltage drop across the regulating resistor  $R_s$  to compensate for the output changes. By suitable compensating circuits, the source impedance can be reduced to zero, this implying that any change in output current drawn causes no change in output voltage. Similarly, 100% regulation, or zero ripple implies that any change in input voltage causes no change in output voltage.

In the case of the camera/c.c.u. pack, the three line time bases cause a variation in output current of the order of 200 mA., at line rate. Capacitors would remove much but not all of the ripple, but the three frame time bases with their 50 cycle pulsing drain would require hundreds of microfarads to reduce the ripple to reasonable proportions.

Two typical shunt and series regulator circuits are shown in Figs. 19 and 20. Note that direct coupling is used throughout, although additional capacitive coupling is used in places to help reduce ripple. The negative supply for the shunt type regulator is essential in order that the grids of the amplifier and regulator tubes should have their correct d.c. potentials, despite direct coupling. This is no disadvantage, as the negative supply will always have other uses.

Fig. 21 is a schematic of the camera/c.c.u. power supply, and shows that beside the +260 volt supply, there is also an output of -500 volts for the VC139A c.c.u., -105 volts for bias, and +150 volts for screen supplies, etc. There is also a centering current supply from a metal rectifier, for the

\* 187 Wood Street, Inglewood, Western Aus.

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# Temperature Compensation in Transistorised Receivers

BY HANS J. ALBRECHT\*

FOR some time transistors have been utilised in communication receivers. In this field, as in most branches of electronics, the use of transistors allows equipment to be simplified, particularly with regard to size and supply requirements. Well known objections to the exclusive application of transistors are their frequency limit and their temperature sensitivity. Whereas the frequency limit determines the range of maximum operating frequency for a certain stage, the temperature sensitivity has an adverse effect upon practically all transistorised stages in a receiver. This adverse effect may be analysed in detail and it is found to consist, in tuned stages, of two major components, namely a change in the quiescent operating characteristics and a variation in effective operating frequency, both due to the temperature sensitivity of transistors used.

Referring to the different methods of compensating temperature effects, an obvious approach is the use of a thermally insulated container with constant inside temperature. Certainly, this method is not very elegant electrically and cannot actually be called a compensation. While normal transistorised communication equipment does not require such a rather complicated set-up, it may be essential with standard-frequency apparatus, similar to vacuum-tube technique.

Another way of eliminating temperature effects upon the effective operating frequency is, of course, the use of crystal-controlled circuits in all oscillators. This method, however, is also in the category of effect elimination and not compensation which we will be concerned with below.

Fundamentally, temperature compensation of transistorised equipment may be achieved on a stage-by-stage basis or as overall compensation, or by a combination of both. If the number of stages is reasonably small, e.g. four or five stages, overall compensation may be simpler and more economical. On the other hand, the stage-by-stage method permits a theoretical analysis of the whole temperature problem, almost to a complete degree. Obviously, overall compensation involves far too many overlapping effects for such an analysis and its best basis is an actual laboratory measurement of the overall temperature effect, followed by experiments with compensating components and circuits. Even with only a few stages, the better approach for the temperature compensation in transistorised receivers is the stage-by-stage method, due to the presence of a variety of temperature effects.

A generally known way of stage-by-stage compensation is the method of resistance stabilisation. In other words,

the resultant quiescent operating point of a transistor stage is made insensitive to temperature variations and other fluctuations by stabilising the electric supply for emitter, base, and/or collector of triode transistors. As triode junction transistors are undoubtedly still the most popular type, we shall here mainly be concerned with them.

As has been pointed out previously, a stability factor may be calculated for a stage stabilised by normal resistors. Its value governs the amount of stabilisation and, on the other hand, the d.c. efficiency of the stage. In other words, an optimum low stability factor results in relatively poor d.c. efficiency because of the additional drain on the supply. In order to allow a reasonable compromise, the author published, some time ago, limiting figures of this stability factor for different applications<sup>1,2,3</sup>. Briefly, a factor of "9" is permissible for audio stages, while tuned stages require a factor equal to or lower than "2" for normal i.f. and h.f. In the case of oscillators, the factor should definitely be in the vicinity of unity.

It is clear that, in communication receivers, provision can be made for some external adjustment of the tuned circuit of at least the first r.f. stage. The other stages, and particularly the oscillators, must display optimum stability for their appropriate operating conditions. Before leaving the resistance stabilisation it may not be amiss to clearly point out that this method permits a relatively straightforward approach in all cases. Tuned circuits can be designed similarly to those known from vacuum-tube technique. Naturally, the internal transistor capacitances must be taken into account. Also the temperature compensation of tuned circuits in resistance-stabilised transistor stages is in no way different from that in tube circuitry. Summarising, once the resistances have been selected according to the appropriate stability factor, almost orthodox design procedure may be utilised.

As just mentioned, a high stability factor being equivalent to poor d.c. efficiency, it is advantageous to consider another method of stabilisation. This is particularly true when the corresponding stability factor has a value of the order of unity, which would mean a relatively large additional drain and, consequently, an especially low efficiency. These would be the operating conditions of oscillator stages in transistorised receivers. Here the author's method of frequency stabilisation of transistor oscillators is a very effective method to achieve absolute temperature compensation at optimum efficiency. The principle having been described previously in this journal<sup>4</sup>, comments may be restricted to saying that the frequency variation due to the sensitivity of the transistor to temperature is compensated by an equivalent

but reverse temperature coefficient in either the condenser or the coil of the resonant circuit, or a combination of both. A first application of this principle was also published in this journal<sup>5</sup> and a more elaborate analysis of the factors involved was described some time ago<sup>6</sup>.

For the time being, the temperature characteristics of capacitors seem to be more reliable than those of inductances. Considering a reasonable circuit-Q, high temperature coefficients may be required and thus ceramic condensers of the titanium-dioxide type (maximum negative coefficient of 750 units per degree) may not be sufficiently sensitive. Hi-K condensers (barium titanate; strontium titanate) have much larger coefficients and are therefore extremely suitable, after an appropriately careful selection. This is necessary, because Hi-K condensers are made for uses as blocking and coupling condensers, etc., and are not normally intended for applications in tuned circuits. Nevertheless, each of these condensers has more or less defined temperature characteristics which can be verified by ordinary equipment, viz. a capacitance meter, a thermometer, and a device for changing the temperature around the capacitor. This device may take the form of a temperature-controlled oil-bath or, in the simplest case, an electric hair-drying fan directed at the capacitor surroundings which include the mercury bulb of a reasonably accurate thermometer. Admittedly, this sort of measurement is not very accurate but in many cases sufficient for approximate data. The same method can be applied in gathering information on the behaviour of the complete transistor oscillator with reference to temperature variations, as has been mentioned before. In the procedure of such a measurement it is essential to make every reading as accurately as possible.

Using this principle of frequency stabilisation, the tuning facilities must be arranged accordingly, which means that with capacitance compensation, circuit tuning should be done by varying the inductance if large tuning ranges are required. Relatively small changes of capacitances are of course always possible without effect upon the compensation. On the other hand, inductance variation for the purpose of frequency stabilisation may also be considered, either by means of a suitable core material or by making the coil itself of bimetallic strips<sup>7</sup>. Then the circuit capacitance may be varied in the ordinary fashion. In any case, a preferable kind of communication receiver is the band-type receiver which naturally requires only relatively small frequency variations so that the frequency stabilisation with capacitance compensation may be applied with conventional capacitive band-tuning.

(Continued on Page 13)

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# Remembrance Day Contest, 1958

The Federal Contest Committee of the Wireless Institute of Australia wishes all Australian Amateurs and Short Wave Listeners to participate in the Annual Contest which is held to perpetuate the memory of those Australian Amateurs who gave their lives for their Country during World War II. It is held on the week-end nearest to 15th August, the date on which hostilities ceased in the S.W.P.A.

A handsome perpetual trophy is awarded annually for competition between States inscribed with the names of those who made the supreme sacrifice, and so perpetuating their memory throughout Amateur Radio in Australia.

The name of the winning Division each year is also inscribed on the Trophy. In addition, the winning Division will receive a suitably inscribed framed photograph of the Trophy.

## Objects

Amateurs in each Call Area (this includes those in Australian Mandated Territories and Australian Antarctica) will endeavour to contact Amateurs in all other Call Areas (VK1 and VK2 are considered to be one Call Area).

## Date of Contest

16th-17th August, 1958.

## Duration

From 1800 hours E.A.S.T. 16th August, 1958, to 1759 hours E.A.S.T. on 17th August, 1958. A period of 15 minutes silence will be observed by all stations on 18th August, immediately prior to the start of the Contest when an appropriate broadcast will be made from VK3WIA and relayed by the Divisional Stations.

## RULES

1. There shall be four main sections to the Contest:

- (a) Transmitting phone.
- (b) Transmitting c.w.
- (c) Transmitting open.
- (d) Receiving open.

2. All Australian Amateurs may enter the Contest whether their stations are fixed, portable or mobile, but only members of the W.I.A. are eligible for awards. Portable/mobile operation is defined as transmitting and/or receiving equipment which is not connected to any private or public power mains or plant.

3. All Amateur frequency bands may be used, but no cross-band operation is permitted.

4. Amateurs may operate on both phone and c.w. during the Contest (e.g. phone to phone, c.w. to c.w., or phone to c.w. and vice versa), but may submit an entry for only one of the above sections listed in Rule 1.

An Open log will be one in which points are claimed for both phone and c.w. transmissions.

A Contestant transmitting on phone but receiving on c.w. may still enter for the phone section (and vice versa). Refer to Rule 11 concerning entry in Logs.

5. Only one contact per station per band is allowed and arranging schedules for contacts on other bands is not permitted.

6. Only one licensed Amateur is permitted to operate any one station under the owner's call sign. Should two or more operate any particular station, each will be considered a contestant and must submit a separate log under his own call sign.

Contestants operating stations other than their own shall be referred to, for the purpose of these rules, as "substitute operators." Their operating procedure will be as follows:

**Phone contacts:** Substitute operators will call "CQ Remembrance Day" followed by the call sign of the station they are operating, and the word "log" followed by their own call sign.

**C.w. contacts:** Substitute operators will call "CQ RD de" followed by the group call sign comprising the call sign of the station they are operating, an oblique stroke, and their own call sign.

Contestants receiving signals from a substitute operator will qualify for points by recording the call of the substitute operator only.

7. Entrants must operate within the terms of their licenses.

8. **Cyphers:** Before points may be claimed for a contact, serial numbers must be exchanged and acknowledged. The serial number of five or six figures will be made up of the RS (telemetry) or RST (c.w.) reports plus three figures which may begin with any number between, or including 001 and 100 for the first contact and which will increase in value by one for each successive contact, e.g. if the number chosen for the first contact is 053, then for the second contact the number must be 054, for the third 055 and so on. If any contestant reaches 999, he will start again with 001.

9. **Entries:** Entries must be set out as shown in the example, using only

one side of the paper. Entries must be postmarked not later than 6th September, 1958, and addressed to the Federal Contest Committee, W.I.A., Box 1234K, G.P.O., Adelaide, South Australia.

10. **Scoring:** Scoring will be based on the table shown.

## SCORING TABLE

		To									
		VK0	VK1-2	VK3	VK4	VK5	VK6	VK7	VK8	VK9	
From	VK0	1	6	6	6	6	6	6	6	6	
	VK1-2	6	1	2	3	5	4	6			
	VK3	6	1	1	3	2	5	4	6		
	VK4	6	1	2	1	3	5	4	6		
	VK5	6	2	1	3	1	5	4	6		
	VK6	6	1	2	4	3	1	5	4	6	
	VK7	6	2	1	4	3	5	1	5	4	6
	VK9	6	1	2	3	4	5	6	1	5	4

**Note:**—Read table from left to right for points for the various call areas.

In addition, a bonus of 25 points may be claimed for the first contact in each call area on 50 Mc. or above.

11. **Logs:** All logs shall be set out as in the example shown and in addition will carry a front sheet showing the following information:

Name ..... Section  
Address ..... Call Sign  
Claimed Score .....

**Declaration:** I hereby certify that I have operated in accordance with the rules and spirit of the Contest.  
Signed .....  
Date .....

All contacts made during the Contest must be shown in the Log submitted (see Rule 4).

12. The right is reserved to disqualify any entrant who, during the Contest, has not observed regulations or who has consistently departed from the accepted code of operating ethics.

13. The ruling of the Federal Contest Committee of the W.I.A. will be final. No dispute will be entered into.

14. **Awards:** Certificates will be awarded to the winners of the phone, c.w., open, and receiving sections in each call area (Northern Territory will count as a separate call area). There will be no outright winner for Australia. Further Certificates may be awarded at the discretion of the Contest Committee.

The State to which the Perpetual Trophy will be awarded shall be determined in the following way:

(Continued on Page 13)

## EXAMPLE OF TRANSMITTING LOG

Date/Time E.A.S.T.	Band	Emission	Call Sign	RST/NR Sent	RST/NR Rcvd.	V.h.f. Bonus	Points Claim.	Blank
AUG. '58	16	1203	TMc.	VK3XU	29001	VK3XU	—	5
18	1205			VK3RU	30004	VK3RU	—	5
17	1115	80		VK4RZ	47125	VK3QR	35	5

Note.—Standard W.I.A. Log Sheet can be used to follow the above form.

## EXAMPLE OF RECEIVING LOG—VICTORIAN S.W.L.

Date/ Time E.A.S.T.	Band	Call Sign Heard	RST/NR Sent	Station Called	V.h.f. Bonus	Points Claim.	Blank
Aug. '58							
16 1203	7 Mc.	VK3XU	29001	VK3XU	—	5	
16 1205	"	VK3RU	30004	VK3RU	—	5	
17 1115	80 "	VK4RZ	47125	VK3QR	25	5	

Note.—Standard W.I.A. Log Sheet can be used to follow the above form.

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insure against loss of your  
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STATED FREQUENCY

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Mounted .... £3 0 0

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Crystals, "Low Drift,"  
Mounted only, £5.

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INCLUDE SALES TAX.

Spot Frequency Crystals  
Prices on Application.

Regrinds .... £1/10/0

**MAXWELL HOWDEN**  
15 CLAREMONT CRES.,  
CANTERBURY, E.7,  
VICTORIA

## REMEMBRANCE DAY CONTEST, 1958

(Continued from Page 11)

To the average of the top six logs  
shall be added a bonus arrived at by  
adding to this average, the ratio of logs  
entered to State licences, multiplied  
by the total points from all entries.

Example:

Average of the top six logs +  
$$\left( \frac{\text{Logs Entered}}{\text{State Licences}} \times \frac{\text{Total of Points}}{\text{from all Entrants}} \right)$$

Acceptable logs shall show at least  
five valid contacts.

The Trophy shall be forwarded to the  
winning State in its container and will  
be held by that State for a period of  
12 months.

### RECEIVING SECTION

1. The rules are the same as for  
transmitting and is open to all Short  
Wave Listeners in Australia. No trans-  
mitting Station may enter this section.

2. Contest times and logging of  
stations on each band are as for trans-  
mitting.

3. To count for points, logs will  
take the same form as for transmitting  
logs. Logs must show the call sign of  
the station heard (instead of worked),  
the serial number sent by it and the  
call sign of the station being called.  
The scoring table to be used is the  
same as that used for transmitting and  
points must be claimed on the basis of  
the State in which the receiving station  
is located. A sample log is given below  
to clarify the position. It is not suf-  
ficient to log a station calling CQ.

4. A station heard may be logged  
only once for each band.

5. Awards: Certificates will be  
awarded to the highest scorer in each  
call area. Further certificates may be  
awarded at the discretion of the Fed-  
eral Contest Committee.

## CONTEST RESULTS

### 1957 R.D. CONTEST RESULTS

It is regretted that when the results  
were published in the January issue  
that VK3AJF's call sign was omitted.  
This should have appeared in the point  
section with a score of 218 points.

### "CQ" WORLD-WIDE CONTEST C.W. RESULTS

#### AUSTRALIA

VK1ALR	14	7,524	138	9	9	B
VK2GW	AB	280,865	651	64	85	B
VK2PV	21	9,288	75	19	24	B
VK2ARD	14	24,012	147	24	34	B
VK4BG	21	13,158	102	18	25	B
VK5JT	AB	11,480	96	20	21	B
VK5MY	14	5,878	55	22	24	B
VK9RU	AB	312,183	541	82	119	B
VK7WA	AB	12,834	99	23	39	B
VK9XK	AB	127,200	416	46	80	B

#### NEW ZEALAND

ZL1MQ	AB	148,596	427	58	58	B
ZL2AHT	AB	9,028	88	19	18	—
ZL4BO	21	41,792	230	22	42	B
VK1APM	21	24,840	231	13	23	B

Some high scores, taken at random,  
of Amateurs in different parts of the  
world are as follows:

#### Single Operator:

KH6LJ	AB	794,364	1240	85	127	D
CE3AG	AB	371,668	611	75	113	D

#### Multi-Operator:

W3VKD	AB	609,088	701	98	209	D
W3FVS	AB	441,264	490	103	214	D
W6TPJ	AB	350,610	465	107	183	D
W8AVJ	AB	375,744	473	107	197	D
5A5TE	AB	712,272	1058	86	162	B
CN8IF	AB	773,640	1244	58	162	B
ON4SZ	AB	348,068	612	64	153	B
DJ3JZ	AB	754,580	1029	82	208	C
KG6FAE	AB	691,601	1321	76	105	D

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**JUNE 14, 15, 16**

The Division has again been successful in securing the National Fitness Camp where accommodation is available for all members of the family, at a nominal figure.

## (Continued from Page 9)

The second i.f. strip may be designed as the first one, as far as the temperature sensitivity is concerned. Tempera-

Go to the VK4 Palm Beach Convention over the Queen's Birthday Weekend.

Summarising, a transistorised communication receiver may be designed such that effects of temperature are completely compensated. Yet, the battery economy remains at a level normally expected for transistorised equipment. Other advantages are small overall dimensions and extreme rigidity.

- (1) E. J. Albrecht, "Design Notes on Transistorized Audio Amplifiers," "A.R.," Vol. 23, No. 1 (1957).
- (2) H. J. Albrecht, "Transistors in Speech Equipment," "GST," Vol. 41, No. 8 (1957).
- (3) E. J. Albrecht, "Frequenzstabilisierung," "Elektronische Rundschau," Vol. 11, No. 12 (1957).
- (4) H. J. Albrecht, "Notes on the Frequency Stabilization, etc. . . ." "A.R.," Vol. 26, No. 3 (1967).
- (5) E. J. Albrecht, "A Transistorized Miniature Transmitter," "A.R.," Vol. 23, No. 2 (1957).
- (6) R. F. Shea, "Principles of Transistor Circuits," Wiley & Sons (1953).

• Please pay your Subscriptions **PROMPTLY** when due. Failure to do so may result in the loss of valuable issues of "Amateur Radio." High costs of production make it necessary to limit the number of extra copies printed each month.

W. AUSTRALIA — FAR EAST															
0	2	4	6	8	10	12	14	16	18	20	22	24			
45	<hr/>												45		
20	<hr/>												20		
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14	<hr/>												14		
7	<hr/>												7		

## CORRESPONDENCE

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

### SHORT WAVE LISTENERS

Editor "A.R." Dear Sir,  
I write this letter in support of Ian Hunt's most timely comments on S.W.L. Groups, and most certainly endorse his comments.

However, before going any further with the subject, I feel it necessary to point out that I, with only about six months as an associate member, have had the utmost help and co-operation from our VK2 President, Secretary and QSL Manager. It is some of our Amateurs, not only VK2s, but in all States, who are "friendly advice and counsel to the beginner" that I wish to discuss.

Many of these chaps are quite prepared to ignore completely the s.w.l., although that individual goes to a lot of trouble to furnish information which must at least be of interest, if not help.

I have sent detailed reports to many Amateurs throughout Australia, if and when there has been something out of the ordinary connected with their transmissions, and will continue to do so. But the number of acknowledgments which I have received have been few. The majority have been completely ignored. To say the least, this is disheartening and tends to show the relationship between s.w.l.s. and many Amateurs.

Fortunately, there are many others who are ready and willing to be of assistance to us, and who will go out of their way to assist anybody who needs their advice.

With the formation of a Listeners' Group in VK2, it is hoped that a closer relationship between Amateur and Listener in this State will eventuate, and that we, of the Group, can show by our actions that we can be something other than just another organization.

I suggest to s.w.l.s. in general that they make an onslaught on the two major contests this year: hop in and have a go. It's our only way to make ourselves noticed apparently. Sooner or later, some of these chaps who have been ignoring us will acknowledge our assistance.

I am not a technical man, but have been an operator for the past fifteen years, the past six of which I have been s.w.l'ing. In that time I have come to realise the importance of our hobby, and do trust that by working closer together we can do much to spread the good work of Amateur Radio.

—Don Grantley, WIA-L2022.

Editor "A.R." Dear Sir,

The letter of Ian J. Hunt in May "A.R." gave me such a case of the "screaming hab-dubs" that I had to pen a reply. Understand that I am giving my views as a "rank-an-file" member and not as a member of the VK4 Divisional Council.

This Division sent letters to all secondary schools in Brisbane some time ago advising senior students that we were forming a Listeners' Group. We had a roll up of almost forty young enthusiasts who were Short Wave Lis-

teners and who wanted to become Hams. They were "straining at the bit" and we put a lot of valuable time into the project but when these ultra-enthusiastic potential Amateurs found that becoming members of the W.I.A. Listeners' Group didn't mean that they would receive Ham tickets automatically their enthusiasm waned and soon their numbers decreased until after three or four meetings you could count 'em on the fingers of one hand and still have two fingers to hold a cigarette with.

Since this debacle, one of our Members (notice I use a capital "M"; he deserves it), Stan Armstrong, VKASA, has been conducting a class which is unique and a wonderful example of unselfishness—there is absolutely no fee charged and the only condition Stan makes is that the members of the class should be Associates of the Division. Mr. Hunt mentioned that in three years the VK3 Group has had approximately 16 of its members successful in A.O.C.P. or A.O.L.C.P. exams; in a little over two years Stan's class has produced many more Hams than this number. He does the course in six months with the first three months on a "flat-out" basis and revision in the rest of the time. It's so good that, in the January exam, after the three months "flat out" period of the course in progress, four of the boys sat and three passed the A.O.L.C.P.!

One of the original "ultra enthusiastic" listeners who stayed with us hasn't even bothered about the class but he is still so very keen on becoming an Amateur. Mr. Hunt says, and I quote: "Of course, it will mean hard and, perhaps at first, almost heart-breaking work," to which I say, why should we have our hearts broken trying to "spoon feed" listeners who won't help themselves? If a man shows enough enthusiasm any Amateur, without exception, will help him. Stan VK4SA, the boys who run the class in Townsville, and the individual Hams in every centre of this State have shown that by the number of Hams they have produced and are producing. The questions "Do they realise the value in having such a group and have they tried hard enough?" and "Can we afford not to have an S.W.L. Group within our Division and miss the opportunities offered?" are, in my personal opinion, idiotic nonsense!

No. Mr. Hunt, you are "talking through your hat" if you include Queensland in your condemnation and should investigate before you make such statements.

—James Rafter, VK4PR.

### NATIONAL FIELD DAY CONTEST

Editor "A.R." Dear Sir,

I am so pleased that at last somebody has expressed his views regarding the National Field Day Contest. I am referring to the letter in "A.R." May number, by George Every, VK3GE.

As a participant in the 1957 and 1958 Contests, I must deplore the lack of publicity given them, both before and after. In the 1957 event particularly I was amazed at the lack of knowledge of the event shown by fixed stations in their contacts with me. The majority did not know that the Field Day was scheduled for that day, and their com-

ments went something like this: "I didn't know there was a Contest on today, but I'll certainly give you a serial number and also look around the band for other portables."

To my mind there are other ways of publicising contests besides "A.R." The W.I.A. broadcasts for instance. I listened to the Sunday morning broadcasts for weeks after the 15th Feb., the date that the logs were due in, but no mention was made of the N.F.D. in any shape or form not a comment. Paragraph "C" of the duties of the Contest Committee states: "Arrange publicity of the rules of all Federal Contests, both locally and overseas, as necessary." It is my expressed opinion that whoever is responsible for that publicity has sadly fallen down on his job.

A method of publicising coming events, quite an effective method, too, in my opinion, would be as follows. As many member stations as possible on all bands likely to be used for any particular contest to initiate a slogan or what have you towards the end of all their QSOs and each contact to be asked to pass the information to future contacts, something like this—VK3XYZ is QSO VK2ABC, towards the end of their QSO, VK3XYZ says, "Don't forget the National Field Day on the 26th of next month, so I'll expect to QSO you again then, so pass this on to all your contacts and help to make this year's contest a bumper event, cheerio and 73."

The lack of knowledge of the 1958 day was so acute and disappointing to me that I, for one, feel very much disposed to give the contest away next year, and I am inclined to think that is what the portables who participated in earlier contests, but not the last, felt about it.

—Alf Chandler, VK3LC.

### SELECTOJET

Editor "A.R." Dear Sir,

Just an enquiry re the Selectojet as appears in every issue of the A.R.R.L. Handbook. I have no doubt that it works efficiently, there is a commercially built one, now appearing in the A.R.R.L. adverts, but to date I have had little success with my attempts. I am sure it would be the greatest interest to your readers if you or your staff have had any practical experience with the unit and could give some hints re the construction and use of same in a short article.

—Arthur Jones, VK3ARU.

[Unfortunately no member of the Publications Committee has had any experience with this unit. Can anyone help?—Editor]

### EMERGENCY NETWORKS

Goomar W/S,

Via Euroa, Vic.

Editor "A.R." Dear Sir,

I have just received some issues of "A.R." from August to December 1957; issues I did not have. I was very interested in the letter from VK4ABT re "Emergency Networks" he mentioned bush fire work. I would like the opportunity of telling you about our Rural Fire Brigades Radio set-up.

In our group here in the Euroa area, we have eight mobile radios and one

(Continued on Page 17)



# 2

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## BLIND LAD PASSES ORAL EXAMINATION

For several years Raymond Bedson, 20, has listened to Amateurs all over the world on his receiver. But now he has achieved his ambition—he will be able to speak to Amateurs as well.

Raymond, blind since an accident when he was 12 years old, passed an oral examination for a limited licence. The P.M.G.'s Department, after representation by the Wireless Institute of Australia, have permitted oral exam-

He is making a meter for the transmitter with a brass scale so that he can take the readings by touch. Later he intends to construct an audio oscillator, which will vary in frequency according to the reading of his test instruments.

Raymond's licence has some restrictions. These are that his power must not exceed 10 watts, the transmitter must be crystal controlled, and must be

built and maintained by a sighted Amateur. After some experience on the air Raymond hopes that the Department will permit an increase in power.

Later Raymond hopes to get gear for the 2 metre band, and to sit for the Morse test so that he can operate on all bands.

Raymond is employed as an assembly worker for a Collingwood engineering factory. He is a keen record collector and has a hi-fi set and a tape recorder.

A friend of Raymond's—another blind lad—hopes to sit for the next examination.



Raymond's sensitive fingers trace the serial circuit in braille.

Block by courtesy of Melbourne "Herald."

inations for the blind and in cases of physical disabilities.

He has had his receiver for three years, but wanted to be a Ham long before that. In fact, he has been Secretary of the Northern Suburbs Amateur Radio Group since 1933. He resides at 93 McMahon Road, Reservoir, Victoria.

For the last two years he has studied hard, mostly from American technical braille magazines, to which he subscribes. Raymond writes his notes and messages on his braille frame.

On April 10 he sat for his limited examination at home—"The examiner was good enough to come here for it," said Raymond—and later he learnt that he had passed. His call sign is VK3ZEB.

Since obtaining his limited license, Raymond has had constructed a 50 Mc. rig (operating frequency 50.59 Mc.) with a QCE33/12 in the final, running 10 watts input. The antenna at present is a simple dipole. His receiver for 50 Mc. consists of a three-tube tunable converter which feeds into the AR7 receiver.

## LINK COIL FORMULA

Something that has eluded most of us over the years is a clear and definite formula for finding the number of turns for that link coil. Some time ago the writer did find just such a formula, which is quoted below. Unfortunately the source has been forgotten, not having been noted, so that credit cannot be given to the original author.

Assuming unity coupling, the number of link turns is given by:

$$N = \sqrt{\frac{T^2 \times Z_1}{Z_2}}$$

where  $N$  = number of link turns.  
 $T$  = number of final tank turns.  
 $Z_1$  = feed line impedance.  
 $Z_2$  = plate load impedance of final stage.

Two points are worth keeping in mind:

1. If you obtain adequate loading with loose coupling, the feed line is probably reactive.
2. A final tank with high  $Q$  makes loading easier, and increasing the final stage voltage-to-current ratio tends to increase efficiency.

—Reprinted from "Break In," Jan., '36.



## VACUUM MOUNTED CRYSTALS

for general communication frequencies in the range 3-14 Mc. Higher frequencies can be supplied.

**THE FOLLOWING FISHING-CRAFT FREQUENCIES ARE AVAILABLE IN FT243 HOLDERS, 6280, 4095, 4535, 2760, 2524.**

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Phone: UM 3387





RAYMOND BEDSON, VK3ZEB, at the controls of his receiver.

Block by courtesy of Melbourne "Herald."

## CORRESPONDENCE

(Continued from Page 14)

Base set. The Base set is in Euroa. The mobile sets are installed in some fire trucks and the others in private vehicles. Three are on fire trucks, one on a Land-Rover, one on a Jeep, and three on utilities. Each Brigade purchased their own radios, no help or money from the Government; we had to buy our own batteries also. The mobile radios are situated all around the district. All of the mobile operators are farmers. All are volunteers of their own particular Brigade, all are officers, and are on call 24 hours a day all the summer, as are the rest of the Brigade members.

When a fire is reported, the mobile radio nearest to the first gets there as quickly as possible. Base comes on the air and is ready to go into action as soon as the mobile gets to the fire. In the meantime, Base notified the Brigade Captains near where the fire is to alert their Brigade and stand by. As soon as the mobile radio gets to the fire he reports to Base the exact location, what Brigades are needed and exactly where to go. What Brigades are needed is from the Captain whose area the fire is.

In our network we are on every morning at 0730, that is to find out where all operators will be, if they

will be in their own area, and pass on any weather reports received from the Country Fire Authority (C.F.A.) radio the day before. Also are on at 1205 and 1930 hours. Of an acute day we come on at 0730, 1205, then after that every hour on the hour until 1700 hours.

Our radios are all crystal locked, all are 6 volt operated. We use 12 ft. whip aerials, with centre loaded coil. Some of us carry a spare battery to a fire. Two other units have a switch that they can use their vehicle batteries while going to a fire, and their other battery while stationary.

Our Base operators are volunteers, and are on call 24 hours. Our main Base operator has a s.w. receiver and when he is at home has it tuned to 2800 Kc., our frequency, all the time and as soon as a mobile comes on the air he can hear him. I also have a s.w. set and have it on all day on 2800, so that as soon as Base comes on, I know there is a fire somewhere, and I ring our Communications Officer and let him know.

Before we got really organised and had a permanent place for our Base set, our Regional Officer's wife, Mrs. Carboon, was the main operator, and she did a wonderful job. Only the radio operators know how many hours she put in on that Base set. My wife and

Mrs. Carboon operated all one day. My wife also operated my mobile set when I had a fire on my property while I was on the fire truck.

During the winter we have skeds so as to keep the wogs out of the sets, more or less, and any faults will show up during the winter and can have them fixed.

Sometimes if the fire is big, we may have five to six radios there, have them right around the fire and have it covered N-S-E-W.

I am working on an idea now that if I go to a fire and we cannot get our radio trucks up to the fire because of hills, rocks, etc., I can take the set out of the truck, put the transceiver in one havasack and the power pack in another, and carry a 6v. motor cycle battery and use a tank whip aerial and transmit to the nearest mobile radio.

We have used our radio in searching for a lost man, two mobiles were with the search parties who were under the control of Police search party from Melbourne, and they were 25 miles away in timbered country.

We are willing to help any way possible, whether it be fire, floods or search parties. We are ready for any emergency.

Anyone wishing to contact me, I will be only too willing to answer any letters.

—A. J. McDonald.

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"THE MICROPHONE THAT SPEAKS FOR ITSELF"

## TYPE "80"

A high quality Moving Coil Microphone of striking appearance and fidelity.

- Ideal for transmission of voice or music.
- Good appearance.
- Solid cast case, finished in stoved black enamel, full tilting head.



TYPE "80"  
MOVING  
COIL

## TYPE "8XA"

A quality Crystal Insert with "Zephyrill" filter.

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- Good high frequency response.
- Full tilting head.



TYPE "8XA"  
CRYSTAL



TYPE "40"  
RIBBON

## TYPE "40"

A high grade Studio Microphone, reasonably priced, for those requiring high fidelity.

- Imported magnets, highly efficient generator.
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- Rotatable cage—360°.
- Chrome copper cage, black bakelite base, and steel gimbles.

## TYPE "90"

Precision built Moving Coil Generator provides good quality reproduction.

- Light weight, durable chrome and baked enamel metal case.
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- Excellent sensitivity.
- Robust construction.



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# The Command Twins

## A CHEAP ALL-BAND S.S.B. RECEIVER

BY ROLF SCHICK, DL3AO

WITH the rapid interest of sunspot activity during the last two years, conditions on the DX bands become more outstanding again. The QRM curve, however, follows close behind.

During the years of 1953 and 1954, I used a small converter in front of a BC454 and the results were very satisfying. The sensitivity was good which came to me as a happy surprise. The lack of selectivity (about 10 Kc. with 3 db. down) didn't disturb me in the least in the then quiet bands.

It first came to my mind that all the receivers I used so far, like BC348, BC-342, BC455, etc., were nearly useless nowadays when some locals and I worked from Luxembourg in August 1956. Using a BC342 in Luxembourg we could make 2,000 QSOs in one week of operation, but in the pile-up of some 50 stations calling us at the same time we often could only fish out the odd ones. A Q-multiplier might have helped a lot but we feared losing the compactness of the station by adding some outboard equipment.

3. Stability must be as such so that an accurate dial reading ( $\pm 2$  Kc. up to 28 Mc.) is possible and that s.s.b. and d.s.b. contacts can be kept without having to finger the dial knob constantly.

4. The receiver should not cost more than \$25.

After having compiled all this information I then had to decide just how I was going to put all this into one compact unit, especially considering the fact that it should not cost more than \$25. It was some weeks later that I found the answer. How did I do it? I shall now let you in on my secret.

The receiver I had consisted of a BC455 and a BC453, of which both are very easy to get at low prices. The BC455 takes care of all-band coverage, good sensitivity and eliminates nearly all images, but using this alone does not give good results because of low selectivity and miserable band-spread. This is where the BC453 comes in. The three 85 Kc. filter gives you that 60 db's. at 4 Kc. which you have often dreamed of using on an old receiver. Don't worry about the three mixers

this 30K resistor and the antenna input of the BC453 with a screened wire.

Now we come to the bands. The BC455 is designed for 6-9.1 Mc. coverage that gives you only 40 metre reception. However, the coil boxes of the receiver can be plugged in and out in seconds and it is possible to wind a coil box for every band you desire. (It's quite similar to the well known HRO boxes.) A rainy afternoon could be put to good use to wind and adjust new coil boxes for 20/15/10. If you use the coil windings given in Table 1, you'll get good results immediately and then just a little bit of adjusting is necessary for top performance.

In the i.f. mixer coil you'll find a honeycomb winding. Unwind it completely and solder a 6K resistor across the mixer former pins 1 and 2. Then connect a 100 pF. capacitor between pins 1 and 6.

Your tuning is done on the BC453. The i.f. amplifier of the BC455 is so broad that one can dial over 100 Kc. on the BC453 to find any reworkable decrease in signal strength. I found a 100 Kc. crystal oscillator very useful which gives me "marks" on the BC455 dial. For instance, if I want to be on 21243 Kc. I get the dial of the BC455 to 21200 (zero beat to the 100 Kc. crystal) and then dial 43 Kc. up with the dial of the BC453. This gives a frequency accuracy which is better than  $\pm 2$  Kc.

All in all these two receivers do a very remarkable job. I have been using this combination now for almost a year and could QSO over 100 countries in phone. Some locals have re-built it with great success, and, too, it's not a one-man affair. Hi.

There are no doubt better receivers in the world, but if you know of a better way to get better reception from a receiver for less money, well, I for one would like to be the first to hear about it.

— . . . —

### WRIST-WATCH RADIO

Though one may smile at this notion, already exploited by the writers of science fiction, it is not as far-fetched as might be supposed. At the annual camp of 2 Press Comm. Sqdn., Royal Signals, Army Emergency Reserve, during October, a transistor transmitter was shown, built into a match box, complete with key and power supply; the transistor used was an American 50 Mc. type actually working on 5.5 Mc., with an input of 3 mW. from a midgeat 4.5v. battery, while the key was a miniature micro-switch actuated by the operator's thumb. With the transmitter alone, ranges up to 1,000 yards were obtained without any aerial.

— "Short Wave Magazine," Jan. 1958.

Band	Ant. Coil		Mixer Coil		Osc. Coil	
	No. of Turns	Length	No. of Turns	Length	No. of Turns	Length
14 Mc.	11	0.35"	11	0.35"	7½	0.24"
21 Mc.	5½	0.24"	5	0.22"	6	0.24"
28 Mc.	3	0.16"	5	0.5"	2½	0.16"

Table 1.—Note: Remove Iron Core in Mixer and Oscillator Coils!

It was through the "CQ" DX Contest of the same year that I realised that we could have done better. I was one of the multi-operators at DY3YZ who has a 75A4. If you have ever heard of the QRM from commercial stations on 3.5 and 7 Mc. here in Europe, you may know what it means to be able to work 25 W/K stations per hour on these bands.

While Knob, DLICR, gave numbers out to so many W and K's, I monitored the frequency on a BC348 that I had in my shack. The only thing I could hear on this frequency was a S9 + 20 db. telephone station. Working with my own station back home did not give me any more satisfaction than before. One might even hear this sort of comment at a club meeting: "Heh, you must have plenty of XW8s since you don't come back when someone calls you!"

Something really had to be changed! I figured that a new receiver must have the following features:

1. Sensitivity must be good, but not too good. In most man-made equipment there is the usual amount of noise and static, however, an ultra-high sensitivity eliminates a great deal of this. Stability, selectivity and a good dial do more to give a "solid QSO."

2. Selectivity should be no worse compared to the Collins 75A4. Both a.s.b. and d.s.b. reception is a must.

• Reprinted from "CQ," February 1954.

involved. . . it works OK. Since much has been written on the excellent qualities of the BC453 I need not say how well this DX works as it can be used without any modification.

You probably know that the frequency coverage of the BC453 is 190-550 Kc., therefore it does not work directly in the i.f. of the BC455 (which is 2830 Kc.). These 2830 Kc's. can be mixed down very easily: The c.w. oscillator of the BC455 is (in our combination) not necessary. That work takes the b.f.o. of the BC453.

Now you simply insert a small (100 pF.) variable condenser between the plate of the 12SR7. Ground and tune it so that the (former) b.f.o. oscillates not the usual 1 Kc. up or down the i.f., but 300 Kc. down the i.f. of the BC455. With the help of a grid dipper this might be done in a few minutes. If you haven't one of these, just listen in on your old station receiver (or in a BC receiver) on 2830 Kc. with the inserted trimmer all out. Slightly turn in the condenser until you hear the tone about 300 Kc. down to the i.f., namely on 2530 Kc. This new result in i.f. of 300 Kc. can be given directly to the antenna input of the BC453.

Now you remove the third i.f. filter of the BC455 (loosen two screws and pull out like a tube) and solder a 30K resistor between the pins of the plate circuit coil. Connect the plate end of



# Papua and New Guinea

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**Location:** Port Moresby, but frequent inspection zone centres required.

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### GENERAL INFORMATION

**Salary:** Rates quoted are actual for unmarried appointees and include allowances and adjustments. Married officers receive a further £125 p.a. Additional Territorial Allowance of £225 p.a. after 5 years' service and a further £225 p.a. after 7 years' service is also payable.

**Eligibility:** Adult male British subjects under 45 years of age.

**Appointment:** Permanent subject to satisfactory probationary period.

**Location:** Appointees are required to serve anywhere in the Territory.

**Accommodation:** Except for Radio Inspector, single quarters only available. Married accommodation not available under 18 months from date of appointment.

**Separation Allowance:** Payable at discretion of Territory Administration; designed to compensate for added expense of married appointees obliged to maintain family outside Territory.

**Leave:** Three months after 21 months in Territory. Additional three months' leave after each six years' service and six months' furlough after 20 years' service.

**Taxation:** Income derived by residents of Territory from sources within the Territory is not at present taxable under Commonwealth legislation.

**Further Information:** An information handbook on the Public Service of the Territory is available from the Department of Territories, Canberra or Sydney, or from any Commonwealth Public Service Inspector, Commonwealth Employment Office or official country Post Office. Other enquiries to Department of Territories, Canberra (phone U 0411, Extension 28A).

**Application:** Submit on prescribed form available from offices mentioned under "Further Information".—

**To:** The Secretary, Department of Territories, Canberra, by 14th June, 1958.

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**Frank P. O'Dwyer, VK3OF**  
190 Thomas Street,  
Hampton, Vic.

- LU Contacted by VK4NG.
- South American I.G.Y. Stations  
Heard by VK4 and VK5.
- W6 Heard by VK3.
- VS2 Worked by VK6.

The main points out of a month which produced some surprising openings. A month marked by the fall-off in the number of JA openings, yet producing enough to keep everyone actively looking for DX in all directions.

The outstanding event happened on April 13 when Bob 4NG contacted LUBOL and LUBOLA. Signals were fair, but Bob found Spanish a language to understand. He should have had Lance 3AHL at his side. Two more to go, Bob. How long before Europe and Africa come your way and you hold the first VK W.A.C. for 50 Mc.

Following the lead set by the ZL boys, the VK4 gang kept watch on the South American stations, and the VK3s revealed the location of the one station by bearing CEAAAB's message. Then on May 8, Hughie B3C's beaming south-east listened to CAAABAB 49.3 Mc. between 1000 and 1100 hours. The station was found to be 80 around 1000 hours. Station identification was heard several times during this period, and the boys were told that the fellows, when you copy those call signs you are in for a thrill. Both these stations run on a 1000 watt transmitter. The boys say: Under those conditions, hearing them off the back of their beams, the VK3/Station American boys were able to hear the VK4/Station American boys' beaming. The VK3s were using at one another, used high power beam-type silent converters, high power. The opportunity should be there in the future to follow the lead

After months of effort on everyone's part and several near misses, on April 18, 1130-1230 W.A.S.T., VE2DQ put a solid signal into WJ, working the six stations on the band at the time. Jim turned the trick by shifting down to 80.045 Mc. away from the JA QRM. We will credit to the stations who usually work JA at 80.050 Mc. the fact that they are only going there when they v.f.o. onto a DX station they wish to call. Col 590 had a near miss during one JA opening when SMT heard him being called by a DU station. Tough luck Col, there is certainly some QRM during some

May 11 at 0005 E.A.S.T. Ian 3ALZ decided to see what a call towards W land would produce. No answer to the CQ, but an S3 c.w. signal near band edge signed over to ZLIDN with the call WENLZ. In his excitement, Ian, a good c.w. operator, almost missed the call sign after hearing the W part. He followed the signal through to the end, then the WENLZ call each time he called CQ. To finally hear him go back to a ZLI. The signal mostly S8, had a slow QSB to S3, but once peaked to S7. At

1030 on 50.4 Mc. a fast signal appeared, but the full W call sign was missed. Calls and listening by the alerted gang produced nothing until 1215 E.A.S.T. when a f.m. station on 50.3 broke in from due east at excellent strength, and was later identified by Mr. George Palmer as a commercial station in Puerto Rico using a very wide deviation.

Following the same pattern of east-west openings, VKS during the period May 2-10, with one day missed, worked into ZL around midday, the May 10 opening lasting 3 hours. The quiet member from Albany, Wally 6WG, had the more consistent conditions, having the edge over the Perth gang. On April 17 Sid 3CI also contacted ZL, possibly by scatter

A welcome re-appearance was made on the band April 28 by Doug 9DH, who celebrated it by working JA and hearing KH8 and DU. On April 27 at 2200 E.A.S.T. 8XK (Port Moresby) worked 9BW. (Signal) on short skip, a distance of 440 miles. Signals were fair for the time. On April 26, 1970, 9BW and DU, 1730 to 2100 VK4 had an excellent opening to KH8, signals running 5W 9BW and BNT have consistently worked into VK3 each week-end around 0900 E.A.S.T., whilst 9XK has found that the ZL path is good, on April 20, working 9XK and 9BW. The ZL path is very lively has now reached an all-time high in VK8.

### V.H.F. CORRESPONDENTS

**PLEASE NOTE**

In future correspondents to this page are requested to forward their v.h.f. notes direct to Frank O'Dwyer, VK3OF, 190 Thomas Street, Hampton, Vic., to reach him by the first day of each month preceding publication. This will allow him time to compile the notes for "A.R."—Editor.

VK3 expended their best ever night operation to JA on April 18 from 2000-2200, signals running to 59 each way. Not one of the local stations was able to hear any of the contacts. In fact, 3ALZ leading the way with 16. There was much jubilation on the part of those who were able to hear the signals. On the morning of the same day, JA had worked into VK3 A, B, & C. A sudden break through from VK3 A, B, & C to VK3 was made. The VK3 gang, they were able to catch up to the VK4s. VK4s welcome back a couple of days later. The VK3s could hear the VK4s but Bob 4NG was heard at the mike from the shack of 4 Whiskey Delta. At the same period the VK3s were able to hear the VK4s but not heard in contact with a VK3. Apparently the VK4s and it frustrating to hear the VK3s work into the VK4s but not heard in contact with the VK3 stations have also been heard. On April 13 3ALZ worked Hughie 5BC by backscatter. The VK3s were able to hear the VK4s week-end by the same method of propagation.

From ZL2mks the news that on April 30 ZL12DS QSOed ZK1BIS (Cook Island). Who is going to work this one first? VK4 can fight it, but it is a long haul. ZL12DS is on 48.8 Mc, Radio Australia, one of their harmonics. An indication that the VK3/VK4 path is open. ZL12DS is on 48.8 Mc, Radio Australia, one of their harmonics. An indication that the VK3/VK4 path is open. ZL12DS is on 48.8 Mc, Radio Australia, one of their harmonics. An indication that the VK3/VK4 path is open.

**HOW TO USE WALL**

April Meeting.—Sorry chaps that the details of this did not reach you in the last issue of "A.R." but owing to the delayed after-Easter meeting, publication was precluded. However, office-bearers for the year were elected, and together with their associate tasks are as follows: 2PM Chairman and Scribe for the "Bulletin", ZZAQ, Secretary and Treasurer, 30A, Vice-Chairman and O.I.C. v.h.f. group for 1W1, Duran, ZZA, Contest Manager, 20CW, Lecturer Co-ordinator and Contest Assistant; 2AWZ, Publicity Officer and your Scribe. The remainder of the evening was

given over to Max TOT who lectured on frequency and phase modulation systems, which was appreciated by members present.

Autumn Field Day, message handling contest, results given were, in order of placings Portable section, 2ZCF, 2HL, 2ANF, Country section: 2DR, 2ZDF, 2ZDL, City section: 2KH, 2ZAL, 2MZ.

**May Meeting**—Under the leadership of our new Chairman and Secretary, ZPM and ZQAQ, an enjoyable meeting was held at the Group's regular meeting place at Gore Hill Technical College on the usual date of 8 pm. The Chairman provided an informative presentation on the use of Army maps, grid references, contours and compass use, which was most apt in view of the Group's recent field days involving the use of these items. In addition, Jim Retiring Chairman, Bob 30A, presented the Chairman's Trophy which this year went to ZPM for his 20 points over the 2000 year's contest at Gore Hill. ZPM was 10A to 10A with 20 points, but who, being Chairman, was not eligible for his own Cup Congratulations to you both and to runners-up, ZPM and ZQAQ.

**April Fox Hunt.** This mobile night event was won by 1PM, navigated by 1ANF and 2ER, and were followed by 1AWZ with 1ZAG, followed by 1ZCF and party Bob 2OA with 2ZAV being the two foxy foxes, provided supper which concluded an enjoyable evening.

80-80 Mc. Activity is waning with DX becoming less frequent, however several stations are building gear and Bob LARG is doing good work with WICEN communicators.

144 Me. Regularly heard on 3 last month  
were 2ZAL with additions to beam, 3PM  
building 407A, 8AJ4 converter, wow! 3ANF  
and ZDR suffering satellites, 2ZCP, 3BV, 2ZBX,  
2ZBU all burning up the S.E. corner, 2ZBQ  
and 2ZC, 4 over, 2ZCH going high power,  
2ZCZ building gear for burst 2ZSR going  
strong. In the country, ZDR is making  
evening contacts with 3ANF and 2ZDL of  
Newcastle is being heard in Sydney 3ARG  
is putting a good signal over to 3APP (Young).

Dural, 2WI v.h.f. gear is progressing well and is being undertaken at present by EZAL, EZCP and 2HL. Bob 2OA is O/C and is nominating volunteers—you may be next.

Ceming Up. Trusting this reaches you in time, don't miss the June meeting as SOA is scheduled to lecture on v.h.f. converters. This will be a follow-up on Bob's well known converter article of "A.R." Dec. 56. Also in June and on the 18th, will be a day treasure hunt; on June 25 a night mobile fox hunt. Finally, a request is made for surplus 3 mx mobile gear as several members without time to build this gear would be interested. Please contact the Secretary, V.h.f. Group, Box 1754, G.P.O. Sydney - 5AWZ.

## VICTORIA

**V.h.f. Meeting.** The April meeting consisted of a visit to the City West Telephone Exchange. About 30 members attended and over a period of three hours they were shown the various types of telephone exchanges, broadcast relay facilities, telephone facilities for the deaf, automatic speaking clock and u.h.f. radio telephone links. The u.h.f. links operating on 800 Mc and 2300 Mc were of particular interest. The VCB was used as a relay technique suitable for the Army and Navy. The VCB, a 2C39A was used as a m.p. in a co-axial tank circuit and this drove a 2C39A grounded grid p.a. in a co-axial tank circuit. On 2000 m.c. m.p. was a Klystron using a temperature controlled external cavity which drove a 2C39A p.a.

The members of the Group would like to thank the P.M.G.'s Department for the excellent organisation of the tour and for supplying extra staff to make the tour the success it was.

50 Mc Band openings for April were rather disappointing, however a very good opening to JA occurred in the evening of the 18th when all of the VKS stations on the band worked JAs. VKs 92KK, 9BW and 9NT have been working between 0700 and 1000 hours by VKEs during the week-end. Syd installing his 19 x 1 ft. 12 element beam. Syd (at Nagasaki) has been working consistently for

### CHANGE OF ADDRESS

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bourne and has been working a goodly part of the DX. Jack ZSDQ has shifted his QTH to Surrey Hills, raised his beam to 40 ft. without much visible means of support, and is radiating a good signal.

Old acquaintances in VK4 were renewed on 20th when a good VK4 break-through occurred during the evening. As well as the regular some new stations viz. 4ZBH, 4ZGL, 4XU and 4XV were worked.

**Field Day** Five portable stations were active on the last V.H.F. Field Day for the season on 20th April. They were 3ZER (2 mx), 3ADU (2 and 1 mx), 3ZCG (2 mx), 3ADG (2 mx), and 3ZAN (2, 1, and 1 mx). Home stations were active on all bands and kept the portable operators busy during the day.

144 Mc. George 3ZCG at Moe, who is active on 144 Mc. and 50 Mc., reports that the following stations are active on 144 Mc. 3ZDY at Sale, 3ZDD at Pakenham, 3ZAB at Taralgon, 3ZAV at Moe, 3ZD at Warragul, and 3DY at Marra. 3ZAB has a new tower and hopes to grace it with a 16 element phased array—3ZAL.

**Country—A** Ballarat and District V.H.F. Group has been formed, by the active V.H.F. Amateur of Ballarat to further activity particularly on the 144 Mc. band. The Group proposes to conduct a contest during June and July '58 as a draw-card for more activity.

The rules are as follows:  
1. The contest will be conducted over a period of eight successive Friday nights commencing Friday, 6th June, and ending Friday, 24th July.

2. The contest will be held on 144 Mc. band only. Scoring will be by one confirmed phone QSO with any or each Group station on any contest night.

3. Scoring will consist of five points per contact increasing by one point for each successive contact with any Group station on any one night. E.g. On June 3ZXY works 3PO, 3 points, and then works 3ZER, 3 points, 3ZCF, 3 points, and 3ZSB, 3 points.

4. A bonus of 10 points per contest night will be given to every station working all Group stations active that night.

5. A confirmed QSO will consist of the passing of call signs, signal strength reports, and traffic consisting of a five-word message, e.g. "Every dog has his day."

6. Logs do not have to be submitted on standard form and to be forwarded to reach VKZBZ, 17

Daffodil Street, Wendouree West, via Ballarat, before 31st August 1958.

Prizes will consist of: Winner's choice of Phillips QQD4/20 or 10 element yagi antenna, gamma matched for 50 ohm and delivered plus a handsome certificate for 1st, 2nd and 3rd. The rejected first prize will go to the station judged the most progressive—3ZB3.

#### SOUTH AUSTRALIA

April was a quieter month for v.h.f. than usual for apart from some more JA contacts of a spasmodic nature, it seemed devoid of the excitement of the past two months. Either that or we are becoming blasé.

A lot of listening was done which was rewarded on occasions, but mostly a month of building, consolidating, QOL exchanges and general cleaning up. Col SRO is an example, who, being about No. 1 JA worker here, has become the 6 mx QSO Bureau and in addition has received a lot of literature and maps from the cherry blossom land. These include great circle maps with JA as the centre, charts and sword details, all in Japanese, giving all the information—no strain—it is thought that he will be taking on the language next to get right on the inside.

Reg 5QR contacted during a test on his p.m. and managed an improvement, although always found it good copy here. George 8GB, between jobs, found time for a quick QSO recently so his gear still functions.

Had a visit from Graham 3ZAP during which time we fired up and contacted Curi 3ZEL, and then Neil 3ZAW, finishing up with Col SRO and Keith 8KT cross-band 1 and 2 duplex. Keith arranged the most of the gear for he was listening to Col and me on 8, transmitting on 3 with Col and me listening on 3. A perfect three-way was made.

During that time Col tried out his v.l.o. gear on 6 (as was Keith) from which it was apparent the trend for DX working to v.l.o. and local crystal was established. Most of the 6 mx boys now are so set up.

Col was on the receiving end of a test recently of a transistor crystal v.l.o. that was modulated and heard quite a distance away, so there is another way to get on 6 mx.

Bob 8RT has come up on 8 with a 3AC7 xtal. one into a 3AC7 driving a Q304/15 final with 30 watts, which he feeds into a 40 mx antenna. A good 5 x 8 up here anyway.

Lance 5ZBC also 5 x 8 up here with a 3 stage rig 815 final, 4w, input, into a 5 cl. beam, which at present is 15 ft. high. A home brew rx right from the front end to the speaker acts as his inhaler. Poke that beam up a bit Lance and you will get full benefit of that 40w. Welcome to the band fellow, hope we hear more from you.

Non 8MK mentions that VSDQ on 50.06 Mc. worked quite a few VK4 boys on 50 mx and that VK8V has worked VK4 and ZL but so far not VK5. As these contacts were made at 0015 E.S.T., presume VK5 blocks were busy then—5ZF.

#### WESTERN AUSTRALIA

The 344 Mc. Fox Hunt took place at King's Park, the usual meeting spot. Bob 8ZE was the fox. About seven cars took off at 8.15 p.m. Don 6ZAV struck trouble at the start when a bottle went in the main rx, which meant a trip to home QTH for a spare. This took about 40 to 45 minutes which gave the other bounds that much start. What a surprise Don and Kay got, when having run down the fox to be told that they were the only ones to get there! Such is luck.

144 Mc. activity is not great at present, most stations operating on 80 Mc. Lance is a new one. 6SO-6ZAV 4WG checks have caused for about three weeks—Wally having an "op."

50 Mc. activity brightened on April 19 and 20 when more JAs were worked—the scarcest stations as far as the writer is concerned are JAs and 9s. During the break-through on the 19th, 6ZAV tuned down towards 50 Mc. and heard a signal at 8 calling CQ CQ Australia—none other than Jim VSDQ. So resulted the first Australian-Malayan contact on 50 Mc. Jim also worked the other VKs that were on at the time and by the tone of his voice was a very happy QM. Week-end 25th to 27th was a dead loss, not a DX signal.

The monthly meeting of the V.H.F. Group was held on April 25 and a few new members were welcomed. 5ZBC and 5ZBF among them.

The next Fox Hunt was fixed for May 28, 6ZAF to be the fox—the late date because of the All-Ad Scramble to be held on May 18.

Rolo 6ZAF was also intrigued by his subject being "Glow Discharge in Vacuum" and demonstrated the variety of colours obtained with various gases and minerals. Supper, as usual, ended another enjoyable evening—6ZAV.

# BOOKS OF THE YEAR FOR RADIO & TV ENTHUSIASTS

★ A.R.R.L. HANDBOOK, 1958 Edition	46/3 + 2/- Post.
★ RADIO HANDBOOK, 14th Edition	85/6 + 2/- Post.
★ BASIC TELEVISION, by Grob, 2nd Edition	66/9 + 2/- Post.
★ RADIO DATA CHARTS, by Beatty and Sowerby, 5th Edition	12/6 + 1/- Post.
★ WORLD RADIO HANDBOOK FOR LISTENERS, 1958 Edition	22/6 + 9d. Post.
★ BEAM ANTENNA HANDBOOK, by Orr	32/6 + 6d. Post.
★ CARE AND REPAIR OF HI-FI, by Feldman	31/- + 1/- Post.
★ BETTER SHORTWAVE RECEPTION, by Orr	34/3 + 1/- Post.
★ ATTENUATORS, EQUALIZERS, AND FILTERS, by Tremaine	28/3 + 1/- Post.
★ NOVICE AND TECHNICIAN HANDBOOK, by Orr	34/3 + 1/- Post.
★ R.C.A. TRANSISTORS AND SEMI-CONDUCTORS DIODES	3/9 + 6d. Post.

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 Fed Secretary: L. D. Burvie, VK2DU, Box 2011W, G.P.O., Melbourne, C.I., Vic.  
 Federal Council:  
 New South Wales—Bob Goddall, VK1ARG.  
 Victoria—Dave Wardlaw, VK1ADW.  
 Queensland—Arthur Wals, VK4AW.  
 South Australia—Rex Richards, VK1DO.  
 Western Australia—Ron Hugo, VK6KW.  
 Tasmania—Doug Fisher, VK1AB.  
 Papua-New Guinea—Bob Coleridge, VK8KK.  
 Fed. Contest Committee: Rep. Harris, VK8RR.  
 Secretary: Bob 1234K, VK3Q, Adelaide, S.A.  
 QSL Bureau: R. E. Jones, VK2RZ, 23 Lendale Street, Box Hill, N.I., Vic.  
 Awards Manager: A. G. Weynton, VK6XU, 8 York Street, Bond Beach, Vic.

## NEW SOUTH WALES

President: Peter Healy, VK1APQ.  
 Secretary: Keith Woodward, VK2ZAU, Box 1794, G.P.O., Sydney.  
 Meeting Night: Fourth Friday of each month at Science House, Gloucester Street, Sydney.  
 QSL Bureau: Box 1794, G.P.O., Sydney. Frank Hine, VK2QL, Manager; assisted by Allan Smith, VK2AIS.  
 Zone Correspondents: North Coast and Tablelands: Noel Hanson, VK1AHL, Ryan Ave. West Kempsey; Warrier Beach: R. W. Rose, 11 Brooks St. West Wolland; Goffsfield and Lakes: H. Hawkins, VK1SVL, 9 Comfort Ave., Cessnock, Western W. Dist. VK1VW, "Cambridge" Rocket; South Coast & Southern: E. Fisher, VK1DY, 3 Oxlands St., Warrawong; Sth. Western: J. W. S. Edg, VK1AJQ, Wallasey, C. Colson; Tamworth: F. W. Fowler, VK1AFP, 4 Thompson Cres., Tamworth.

## VICTORIA

President: J. G. Ball, VK3VE.  
 Secretary: F. R. Lancaster, VK3FL.

## FEDERAL

### FEDERAL CONTEST COMMITTEE

The following have will sit upon the Federal Contest Committee this year: Chairman, M. Bowen (VK6XU); Secretary, R. G. Harris (VK8RR); Manager, R. H. Richards (VK2DO); Committee-men: R. V. Gals (VK3AG) and L. E. Catford (VK3LC).

### AMATEUR ADVISORY COMMITTEE IN SOUTH AUSTRALIA

Advice has been received from the Federal Council for the South Australian Division that the following will serve on the Amateur Advisory Committee: W.I.A. Members—G. M. Bowen (VK6XU), R. G. Harris (VK8RR), R. A. Edwards (VK6GU), Non-Members—A. R. Anderson (VK6GU), F. F. Bourne (VK6BU), A. H. Brooks (VK6KO).

## FED. CONTEST COMMITTEE

**IMPORTANT AMENDMENTS TO S.D. RULES**  
 Elsewhere in this issue will be found complete rules for the 1958 Remembrance Day Contest.  
 It will be noted that a few important amendments have been made to the rules this year. These amendments were made after careful consideration had been given to suggestions submitted by the Divisions in response to a request published by the Committee in the February issue.  
 These amendments have been made with the object of encouraging all Amateurs to enter

## CONTEST CALENDAR

Compiled by W.I.A. Fed. Contest Com.

★

### R.D. CONTEST—

Dates: Saturday, 10th August, 1958 hrs.  
 E.A.S.T.: Sunday, 17th August, 1958 hrs. E.A.S.T.

### VK-ZL DX 1958—

1st and 2nd Week-End October.

# NOTES

Administrative Secretary: Mrs. May, C.O.R. House, 191 Queen St., Melbourne.  
 Meeting Night: First Wednesday of each month at the Radio School, Royal Melbourne Technical College.  
 Divisional Sub-Editor: W. M. Jones, VK3YE, 7 New St., Surrey Hill, E.D.  
 QSL Bureau: Inwards and Outwards—W.I.A., 151 Queen St., Melbourne, C.I., Vic.  
 Zone Correspondents: Western: W. J. Kinnella, VK3AKW, Magdala; Eastern: S. H. Miers, W. Wink, 48 Cranley St., Warranwood, and W. Zimmer, VK3AWZ, 70 Skene St., Newtown, Far North Western; M. Folic, VK3GZ, 193 Lemon Ave., Mildura; Midlands: R. J. Jossan, VK3ND, Farnsworth St., Castlemaine; North Eastern: L. Ellison, VK3ALE, 7 Orr St., Shepparton; Eastern: J. Spork, VK3AJX, 30 Marshall Ave., Moa.  
 QUESTIONS  
 President: Frank Bond, VK4ZM.  
 Secretary: W. J. Ratler, VK4FR, Box 638J, G.P.O., Brisbane.  
 Meeting Night: Fourth Friday in each month at the State Service Union Rooms, Elizabeth Street, Brisbane.  
 Divisional Sub-Editor: A. Simpson, VK4ZAE, 37 Baden Powell and White Sts., Everton Park.  
 QSL Bureau: Inwards—J. Flies, VK4JF, Vanda St., Buranda; Outwards—Miss Clair O'Brien, 93 Jardine St., Stafford.

the Contest, with particular emphasis on Amateurs in the larger Divisions who could, by a concerted effort, well contribute towards their Division winning the Contest.

The following are a few comments on the rules which have been modified, with an explanation as to the reason for such modification.  
 Rule 1.—No substantial alteration has been made here, but section (d) now states clearly that the receiving station (open VLF, mobile phone and c.w. stations may be logged) and that there is only one section for receiving contestants.

Rule 4.—This is an important amendment and now permits phone and c.w. stations to freely work each other and providing they are transmitting in the section they have chosen, neither will lose points for themselves or their Division. Remember, however, that you must record all your contacts even should you transmit in a section other than your own and no points are claimed for so doing. Should you fail to do this, your contact, who may be transmitting in their own section, will lose his points by your omission.

Rule 14.—This amendment is vital and it is imperative that all contestants understand the implications of the formula by means of which the winning Division is determined.

The important amendment is the bonus which is now added to the average of the top five logs. Note that this bonus is influenced by the total points from all entrants.

Should you not be in the top six, every contest, nevertheless, will count for your Division. In previous contests, a marked little whether you made 5 or 100 contacts, your log counted only as a multiplier. This may have been the reason why so many contestants did not submit a log, in fact, during some checking sessions the call "no log" became monotonous. This has now all been changed, so do not forget to submit your log, no matter how small. You are just as important to your Division now as is the top scorer, providing you have made at least five contacts.

Receiving Section. No change has been made to the rules of this section but it has been clarified. Experience last year showed that most receiving contestants did not understand how to apply the scoring table and in some instances we found they were claiming points on the basis of the Division in which the call originated.

This is incorrect. If you remember that you are like a VK3 transmitting in Western Australia, and a VK6 transmitting in Western Australia, and so on, you cannot go wrong. An example of a receiving log has been shown to give you further help.

Zone Correspondents: Maryborough: R. J. Clump, VK4BG, 50 North St., Maryborough, Tasmania; R. K. Wilson, VK4RW, Hogan St., Stuart, Townsville.

## SOUTH AUSTRALIA

President: W. J. Bulling, VK5KX.  
 Secretary: R. W. Austin, VK5KA, Box 1234K, G.P.O., Adelaide, Telephone, UX 2321.  
 Meeting Night: Second Tuesday of each month at 17 Waymouth St., Adelaide.  
 Divisional Sub-Editor: E. C. Daw, VK5EF, P.O. Box 44, Gawler, S.A.  
 QSL Bureau: G. Luxton, VK5CR, 27 Belair Rd., West Mitcham, S.A. (Inwards & Outwards).

## WESTERN AUSTRALIA

President: L. Roeger, VK8HR.  
 Secretary: P. E. Zimm, VK5BE, Box N1038, G.P.O., Perth, W.A.  
 Meeting Night: Third Tuesday of each month at Perth Tech College Annex, Mounts Bay Rd.  
 Divisional Sub-Editor: J. R. Elms, VK5BE, 29 Central Road, Kalamunda.  
 QSL Bureau: Jim Rumble, VK8RU, Box F519, G.P.O., Perth, W.A. (Inwards & Outwards).

## TASMANIA

President: P. E. 1. Dunn, VK7PD.  
 Secretary: K. E. Millin, VK7KA, Box 371B, G.P.O., Hobart.  
 Meeting Night: First Wednesday of each month at W.I.A. Clubroom, 147 Liverpool St., Hobart.  
 Divisional Sub-Editor: W. W. Watson, VK7TY, 36 Brooker Ave., Manass.  
 QSL Bureau: J. H. Hatcher, VK7JB, 39 Willowdene Ave., Lower Sandy Bay, Hobart.  
 Zone Correspondents: Northern: K. J. Briggs, VK7AG, 201 Melbourne St., Launceston; North Western: L. S. Eddington, VK7LS, 3 Jenner St., Wynyard.

## PAPUA-NEW GUINEA

President: F. N. Nolan, VK9TN.  
 Secretary: P. G. Zimm, WIA-L8004.  
 Divisional Sub-Editor: R. Clark, WIA-L8001, P.O. Box 204, Port Moresby.  
 QSL Bureau: D. S. Brown, VK9SB.

The Committee wishes you all the best of luck in the Contest. They feel you will appreciate the amendments made and trust you will all co-operate in making this the best Contest ever.

—R. G. Harris, VK8RR, Secretary F.C.C.—

## FEDERAL QSL BUREAU

The new address of the U.C.A.R. Bureau is: The Federal QSL Bureau, 100 Victoria Road, The Elizabethville and Leopoldville addresses are obsolete.  
 VK8R18 reports hearing VB1BB/VSS, Maldiv Islands, from 1200z onwards on 14040 Kc. c.w. He also is hearing HV1CN, Vatican City, on the phone band.

One of the most successful of the many South African VLF and VLF operators, from the DX point of view, is Gwen Smith, Z81NG, who is music principal at Helderberg College, Somerset West, Cape Province. Gwen is active on 14 Mc. c.w. and bemoans the fact that not many of the VK stations worked have sent QSLs. Among other achievements she has made W.A.Y.L. and W.A.E.

Novice stations in U.S.A. are soon to be allotted the prefix WA or WV, due to the W range being increasingly congested. The two districts in which the new prefix allocations will be made are W2 and W6.

A re-arrangement of district areas in France has resulted in the issue of F3 call signs.

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**EVENINGS AND SATURDAYS**

in the area, to a time table during the afternoon, whilst the hounds take cross bearings on their maps supplied, using pencils, compass, etc. Five hounds turned up and Allan Ormon was the fox. As this hunt was so successful, Reg JAYV, of the same type, to be held at Yarran on the last Sunday in May.

David 3DY has been operating mobile around the Gippsland area working a few VK3, 5, 6 and ZLs on 80 m. and Jack 3JK was operating portable in the Western District on 40 m. and 815, and now still ironing out the modular bugs in his blue-shirt modulator, using a single 607.

David 3DY was granted permission to operate in the Central Victoria Exhibition at Maffra, demonstrating HM Radio to the public during May 18, 20 and 21.

#### NORTH EASTERN ZONE

On Sunday, 20th April, a very representative gathering of the North Eastern Zone were the guests of the Benalla members. At 11 o'clock all members with XYLs, YLs and harmonics assembled at the Regal Theatre. A meeting was held in the theatre. Arthur 3AUL was the zone Secretary, Bill 3AJO zone correspondent.

Members of the North Eastern Zone wish to convey their thanks to Andy 3FD for his excellent work at the Benalla gathering.

Zone hook-up times, 1300 hours every Tuesday on 40 m, and 2000 hours every Monday on 40 m.

It would appear that there is going to be some activity on the DX bands from 3AXW, 3ASF and 3ALE who have all bought towers and are now busily remodeling and painting and reading up on beam construction. Bruce 3AGC has almost completed a big project in the construction of a 100 ft. mast. Alan 3JF still busy on t.v., 2 and 6 m. Alan 3JF maintains daily sdxs on 8 m with 3AFF, 3ALE and 3CL. Ray 3FI busy on a.d.o. project and also working a 3ADZ working steadily on the construction of a new all-band tx. Congratulations to George and XYL, Ivy, on arrival of No. 1 harmonic, a son, all doing fine.

#### WESTERN ZONE

During April we held our Get-Together Field Day in Moresham. Had a nice gathering and it was a pleasure to have all the members brought their workfolk with them. Merv 3AFD and Allan 3AJX took us on a tour of inspection of the A.B.C. broadcast station. Later we were entertained at the home of Merv and his good XYL Nora. Firstly, we had a session watching t.v., then Chas 3IB and Merv 3AFD each made use of the radio trip to Antarctica. These were extra well done, and Chas must be congratulated on the way they came out. We had a complete range of interesting scenes after leaving the Heads until he returned. Last of all we must thank Nora and Merv for treating us to such a nice supper.

#### MOORABBIN AND DISTRICT RADIO CLUB

At the March meeting of the Club we heard a lecture from Mr. Les Jackson, 3ZAR, on equipment for use at ultra high and very high frequencies. Les illustrated his talk with equipment, and considerable interest was shown in the lecture. The lecture was brought along thanks once again, Les, for an interesting evening.

At our April meeting the guest speaker was Mr. George Robertson, 3WJ, who spoke to us on the Civil Defence Emergency Network, with reference to the school at Mt. Macedon and the arrangements which would be made to operate in the event of any public disaster. Members were so interested in discussion that George and Les and I left the room for his talk. Nevertheless, a good time was had by all. Don't forget your promise to come and see us again, George.

3AFD has been active on 3 m from our Natter Night, the first Friday of each month, and on 40 m from portable locations in the club hook-up on the fourth Friday of each month.

Club member Ian Caporn, 3AIX, has had lengthy trips away from work due to ill health, but he wishes you all to be there for a speedy recovery, and hope to see you back at Club meetings very soon.

#### QUEENSLAND

A considerable amount of chopping and changing has been going on recently since the normal routine of the Division's activities. This year Anzac Day coincided with our general meeting night and in order to secure a good roll-up, the meeting was postponed until the

first Friday in May. Resulting from this change in plans, the usual 2 m. Tx Hunt (held on the first Friday of each month) had to be cancelled. However, after this, we expect things to settle down once more.

At the last Council meeting Jim 40B presented the balance sheet which was subsequently published in "A.I.Z." Council members were pleasantly surprised at the very efficient way in which Jim has carried out his duties and at the number of suggestions that he has put forward in an endeavour to streamline and increase the financial position of the Division. A vote of thanks was passed to Jim for the obvious effort that he has put into the office of Treasurer.

The position of Outward QSL Officer has not, as yet, been resolved, but in the meantime Jack 4FP has consented to taking on the Outward Bureau to prevent a bottle neck of cards. It is a tremendous task and with the Inward Bureau to look after as well, Jack has a job and a half on his hands!

The Convention Committee presented an outline of events and arrangements have been made with two able women, Mrs. Lane and Mrs. Ferguson, to handle the catering. The boys, Brian 4ZAP, Bruce 4ZBD and Tom 4ZBH, have already embarked on an extensive campaign to make the Convention a success. Circulars have been dispatched and it is expected that Hams who have never been seen before will turn up at Palm Beach.

The invitation is open to anyone who professes an interest in Radio or any field of Electronics. You can be assured of separate accommodation for all, a very good kitchen (with plenty of good food and an air-packed week-end of events!) So what about it chaps? Keep the Queen's Birthday week-end in June free for the Convention at Palm Beach.

After the Council meeting an emergency committee meeting was held with Vince 4VJ in the chair. Preliminary details for the possible future zoning of Queensland in relation to emergency centres was discussed. A great deal of thought has gone into this scheme and it is hoped that the future I.C.E. trials will gradually eliminate all the various weaknesses and we hope, finally present 100 per cent. safe coverage for VK4 towns and all places. Outside help will come in the country. Amateurs to help again boys—be on your toes!

W.I.C.E.N. gear will, we hope, be on display at Palm Beach. It is hoped that some gear can be stored at the W.I.C.E.N. discussion which is part of the Convention programme.

At the last general meeting the members were suspended in order to provide enough time for two very interesting lectures on I.G.Y. Whistlers and Isophoric Propagation. Our thanks to Mr. Trevor and Mrs. Evelyn Boren for making the evening exceedingly interesting. The lectures were very informative and enjoyable, and a real high gain hi-fi audio amplifier and a crystal should have no difficulty in receiving "whistlers!"

## ANNOUNCING THE 1958

## PALM BEACH CONVENTION

at the

## NATIONAL FITNESS CAMP

## AT TALLEBUDGERA

on the Gold Coast of VK4

during the

## QUEEN'S BIRTHDAY WEEK

END—14th, 15th, 16th JUNE

To tell you all of the activities you can enjoy at the 1958 VK4 Palm Beach Convention would spoil the Convening Committee's fun—but here are a few highlights to whet your interest:

Conferences: W.I.C.E.N., V.H.F.

Competitions: The Bob Campbell Memorial Contest, 50 Mc. Contest, 7 Mc. Scrambles, 144 Mc. Hidden Tx Hunts and Blindfold Hunts.

Companionships: Barbecues, Rag-chews, Entertainment, Gear Pool.

The meeting was resumed after the lectures and due to lack of time, many items were referred until the next session of Council.

The President, 4FP, Bill 4KO and Alan 4ZAE over the last long week-end took a flying visit to the Victorian State Capital, Melbourne and Bundaberg, and the hospitality of everyone was warm and exceedingly pleasant. Many thanks to the boys who were organized and made and suggestions were picked up all along the line. The boys had a mighty time and their thanks go to all the country boys up there "who did em proud!"

#### TOWNSVILLE

A meeting of the T.A.R.C. was held last week and the club was very active as usual. The club is again going into its old lethargic state, due to the non support of other members. What about it boys? Surely winning next month is not much to expect seeing most of you enjoy daylight working? Lecturers were nominated for the next four meetings in an endeavour to draw a crowd.

Conditions for the past month have not been too startling. The 2 boys working desperately to come up with a 30 Mc. beam seems to be right out in this area.

Ray 3VRA has advised all and sundry he is looking for information on cubical quads, so as to try and get a decent signal out past the coastal prove.

Most of the activity in the North seems to be on the 7 Mc. band, the following stations being heard: Andy 4BW, still keeps the time and a 30 Mc. beam. Basil 4ZV, 30 Mc. 4ZP are now close to 1800. This, it is understood, is for a period of nearly five years and not a bad record. Basil 4ZV busy constructing a 21 Mc. combi. quad, doing his own electric welding. Now uses 8HO "Hallercrafters" for a spell off the Eddystone. Claude 4UX not heard from since he arrived in Bundaberg trying for a fortnight to get there. Hold up was due to floods. He has Jess and the three harmonics with him to keep him steady. Harry 4ZG has been busy lately. He has said it is capable of lifting the cliff clips of his valves—roast at any day, soon. Vern 4LX still busy listening and working with Mc. Speaks now in broken English from force of habit. Shifted to new location and new free of GRN. Don 4D not heard on 30 Mc. lately. Worked himself out of a jam. Harry 4ZG and Bert 4BP only comes up occasionally due to QRT and works Basil 4ZV: rag-chews about 144 Mc. and Alex 4MA not heard for some time now.

Harry 9HO has left the islands and came to the State and gone into business at the Molloy. He has a 30 Mc. beam. Basil 4ZV was left at Cairns. Mac Vic 4BJ at Beautiful Bundy is entering the s.h. business with the three brass blades. Recently bought himself a 1000 Watt 4EC came in on mobile from Yeppon on a few mornings recently, while waiting for the fat to bile to supply the beautiful table. Bill 3UG came on whilst operating from Bell mobile during a visit to Noel 4QP. Bob 4RW has at last got rid of noisy transformer in the street near his QTH and now hopes to improve the DX score.

Bob 4TK has his 5-band 80w. rig completed and is now busy with it. Has installed a multi-band aerial, coupled with a bridge connected with meter. Aften, who is known around the north as NEJ99 after his V.W. car registration, has been back to the north. 30 Mc. and has logged 250 JA stations on this band. Hopes to get a 2 Mc. sign some day. Nick 4WT has been back for some time. He has been busy hammering a long Con-grais Nick to promotion as P.O. Graham 4DJ not long on the air has amassed a total of 1000 QSOs. Edna 4OW has been back. Aften has a nightly round table with Tom 4TE, Andy 4BW and joined by Frank 9FN. Edna 4OW has been back on 30 Mc., and did not come back to my call for news. Ted 4EJ still in Sydney getting eye treatment and suitably looked after by all the boys there. Ewen 4EL has been to the W.I.A. meeting to meet many others.

#### MARYBOROUGH

4DJ has put a pre-amp. before his speech mps, and with a new crystal mike, has improved modulation. Grahame has nearly completed his rack tx and when not playing with his 30 Mc. beam, can be heard on 40 and 15 m. 4XB is getting bits and pieces together to build a modified 6GZU beam. Should perk up the 80 ft. tower. 4GJ has been operating on 10 m. 4GH removed the cobwebs from his rx and re-aligned it. Was also seen glowing over a new transmitting condenser so it looks like Gordon may soon make a comeback. 4BG has re-built the three aerial couplers he uses with his 6GZU beam, to eliminate the plug-in switches. Operates on 15 and 10 m every day.



Programme Committee chose a topical  
in v.h.f. converters for last month's  
when Gordon 5XU and Bob 5PU  
the rostrum on that subject. Gordon  
all gave us a run through of his 5GL  
converter, which later was handed  
(minus the crystal for detailed inspec-  
tion) was set up for 108 Mc. use having a  
rock and coming out at 18 to the  
i.f. No provision was included for  
tation of exact 108 mega, he having his  
Bendix wavemeter, etc., available to  
back to zero beat WWV and do it that

minitrack equipment was then de-which is far too detailed to give here. To say that it is all complete by a U.S. manufacturer, and according to had to be seen to be appreciated both in ownership and performance. One outstanding feature seems to have been its unitization whereby easy servicing is possible by the mere replacement of faulty units without leaving the actual fault finding and repair to the bench. Quite an idea for our gear!

high line input, with Alament centre of r.f. SAKS, going down the centre of the tube contributing to a clean noise-free, a modified piece osc. circuit with rock provides the basis for all the required for both conversion and calibration as well as checking against WWV. 80v. the highest voltage used, aided in keeping down and also temperatures, thus oscillator stability. A very creditable work, that has performed according to

President, Lloyd 50K, expressed the opinion of all present when proposing the thanks to our speakers.

question of hedges had not resolved itself and it was not thought it would be very wise to resolve to reduce the nominal value of the hedges by 5/- as from date and to credit all the money so received to a hedge account. It was decided to issue new badged do not close, and to buy one so it would not complicate the books. It was decided to keep to thus handle things this way. Treasurer Jim to devise a means of keeping book-keeping and at the same time saving money. He has gone to the FKI area to see what can be done. The committee is watching the funds to Doc GMD, the way reminds those who haven't paid their 1958 dues, to do so smartly to maintain financial status. Don't put it off any longer fellows, don't wait for any more. Send Doc the doings and all with

of portables broke out over Anasand, including Keith 5MT on Yorkville and Ian SIW in Vlinders Ranges. I whom were putting in fine sigs over Keith used a KFS final modulated by of SL6, not sure of Ian's rig, but think Other portables were Tom STL, Gordonack SWM, Dave SRF and Bob SRI, and from reading some of their mail, it is

Les SAK holidayed on South Coast of VK3 and operated portable/mobile whilst at different spots there. He also advises success with tuned whip and had a very interesting time, although he reckons that 7 megs. is hard to work through from there to VK3 because of the many very strong VK7 sigs heard each night. Daytime VK5 was no strain so he kept in touch that way and was able to hear the session each Sunday.

Brian 3AV and XYL Nola dropped in recently, they being in this fine State on honeymoon. Congrats to them and we hope the shacks visited here will help Nola see how necessary "shack" life is and how the OM must have a free hand in its use, etc., etc. Anyway, we were delighted to see them and wish them all the best for the future.

DX has been very good lately with some smart doings by some of the gang on 15 and 10. Found myself in a four-way with a G3 and Harry SEU with Joe SJO on the hook also, a f.b. contact with all signs heard here. Austin SWO heard working consistently on 10 mx. Bram SAR, Les SLC to mention a few that have been heard taking advantage of those bands. It looks like 10 mx staying useful to end of May.

Noise levels (line mostly) continue to annoy a large number. One solution seems to live at Elizabeth where Tubby SNO claims he does not know what we are talking about when we mention noise. Of course with no overheard cables or insulators to do their worst, it's a wash over.

Some good news for the mobile boys is the introduction of the transistor OC16 which in Class B can provide enough audio to modulate about 30 watts input to a final. Transformers to couple same may be a problem, but no doubt there are some old fv. or so vibrator transformers will be dug out and tried. Who is coming up with the first all transistor modulator?

Keith SKW went M/M early April when according to Gordon SXU he (Keith) was ostensibly fishing, and not hearing anything about it since, presume the possible fish was extremely small. The Co. SWC is Burnie & Co. SWC advise that due to village improvements or something up there, a road is planned to pass right through their shack and antenna farm, so rather than put up with the traffic passing through the building, same as the road running through the building, some one is to be called for the day the rhombic is moved to just lift the poles out and stagger to the new spot and plant them again.

W.I.C.E.N. has stopped the roster system until next season. This doesn't mean a close down rather does it imply an opportunity for all members to get familiar with their gear and the operating procedure, your committee ask that you make as much use of the "quieter" months as possible to thus become proficient, and above all to retain the "instant" availability of the net.

Dropped in and saw Pete SRB at Modbury recently where he is getting his gear set up in good style, and can be heard from most areas. He has a new wire and a new antenna even better than the DX and with plenty of room to take a few sky wire plans are afoot.

Joe 3G0, that versatile and hard working ham, has been a member of the Modbury Club, but not to add to the boys' club this time. His granddaughter if you please, born on 20th April. He was spreading the news so well that his final gave up the ghost and he had to fall back on the old saying, "I can't tell you how I know. He, with a name like that too, spending so freely, must have been pleased. To top all, Joe's other daughter duplicated the job on 8th April, and the 100 can sing, breaking over the roof.

— • • —

## SOUTH WESTERN ZONE

Once again Ham Radio has helped in the time of trouble. Bert TBI, at Scottsdale, was able to contact Col TLZ, at Launceston, and help co-ordinate P.M.G. line gangs from Launceston and Scottsdale during a recent period of telephonic isolation. Could have been a W.I.C.E.N. effort if we'd been quick enough. Bert. Congrats anyway. Bad luck about the mast at the station.

Called in to see Lee TKC at Devonport recently. Lee has changed his QTH in the last

A strange voice heard over TJO some time ago has evidence that Dennis TRN is still in town. Some heavy study on Dennis' past should finish in June. We may hear the Treasurer again. Associate Ken Brown has invested in a car. Pleased to hear you know a good make, Ken. Roy TRN has built an amplifier which has a characteristic so flat you could use it as a straight edge. Roy says AAA's are still good bottles. Associate Ken Hancock is still playing golf. Haven't seen any photographs in the paper lately Ken.

Associate John Lee has apparently started a freighting service between Devonport and Mole Creek. Believe he is transporting his Radio gear home whilst he changes his boarding address. Ray Schulz, another Devonport associate, has nearly worn out Hon. Sec. Max Ives' winding machine. Ray, that machine is in need of some adjustments, no welding transformers. Allan Baptist has gone in for public reception. He receives H.E.C. all over the band; any band.

With all this \$ mxx activity, Geo YXL has been unable to hear a thing. Appears to be quite convinced there is an ionised layer over Bass Strait which is reflecting the signals into VK3 land. Have heard a rumour in Devonport that a VK3, Harold Hancock, is with us.

## WILLIAM GLADSTONE TAIT

We record with regret the passing, at the age of 57, of our friend Bill Tait. He was an Associate of the Tasmanian Division and, at one time, its Secretary for four years.

Bill came here from Sarawak. He was in charge of posts and telegraphs there, at the time of the Japanese invasion; and one doubts if even the hardships that followed had much effect upon his high spirits and cheerful ways. He will be sadly missed, and the sympathy of all members is extended to Mrs. Tait in her greater loss.

1/- per line, minimum 3/-.

advertisements under this heading will only be accepted from Institute Members who desire to dispose of equipment which is their own personal property. Copy must be received by 8th of the month, and remittance must accompany advertisement. Calculation of cost is based on an average of six words a line. Dealers' advertisements not accepted in this column.

**FOR SALE:** Eddystone Model "840" AC/DC Communication Receiver. First class condition. Reasonable price. A. E. Tinkler, 28 Montana Stret, Burwood, Vic.

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**SELL:** Converter, tunes 40 to 90 Mc., £18. 10-Tube 50 Mc. Receiver, with power supply, £20. M. Hillard, 57 Gardania Street, Blackburn, Vic. (WX 2498).

**SELL:** Modified 1155A Rcvr. less power supply and spkr. What offers? Exchange considered. Loveday, Elimbah, Qld.

**WANTED:** AR7 Manual. T. K. Tenant, Park Street, Tetbury, Vics

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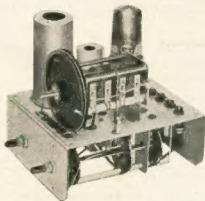
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